March, 1929
Vol. XL No. 3

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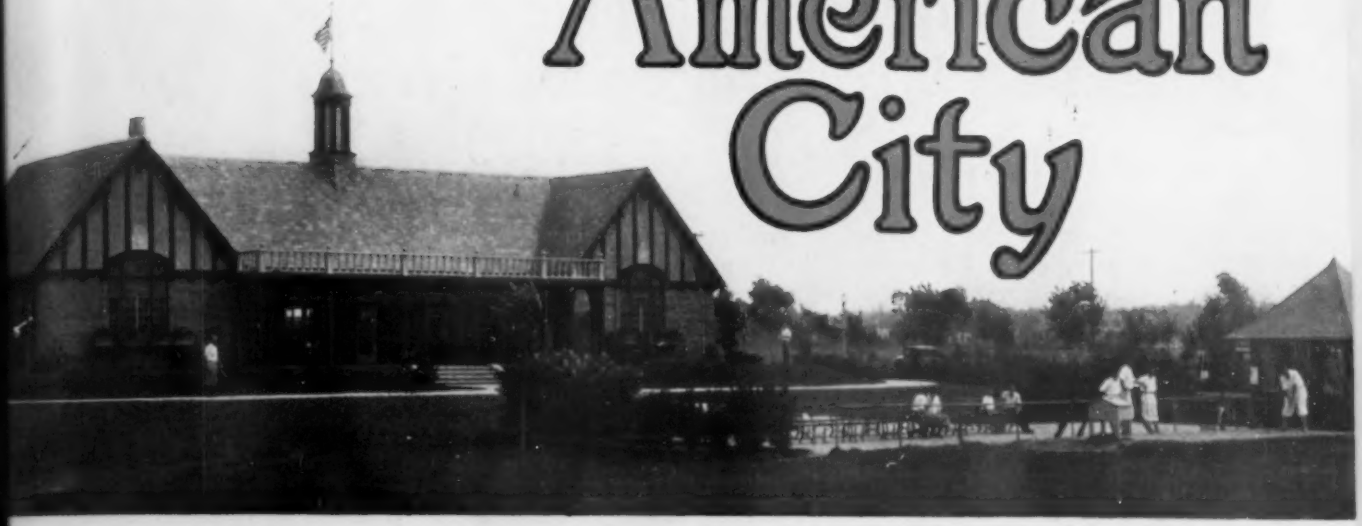

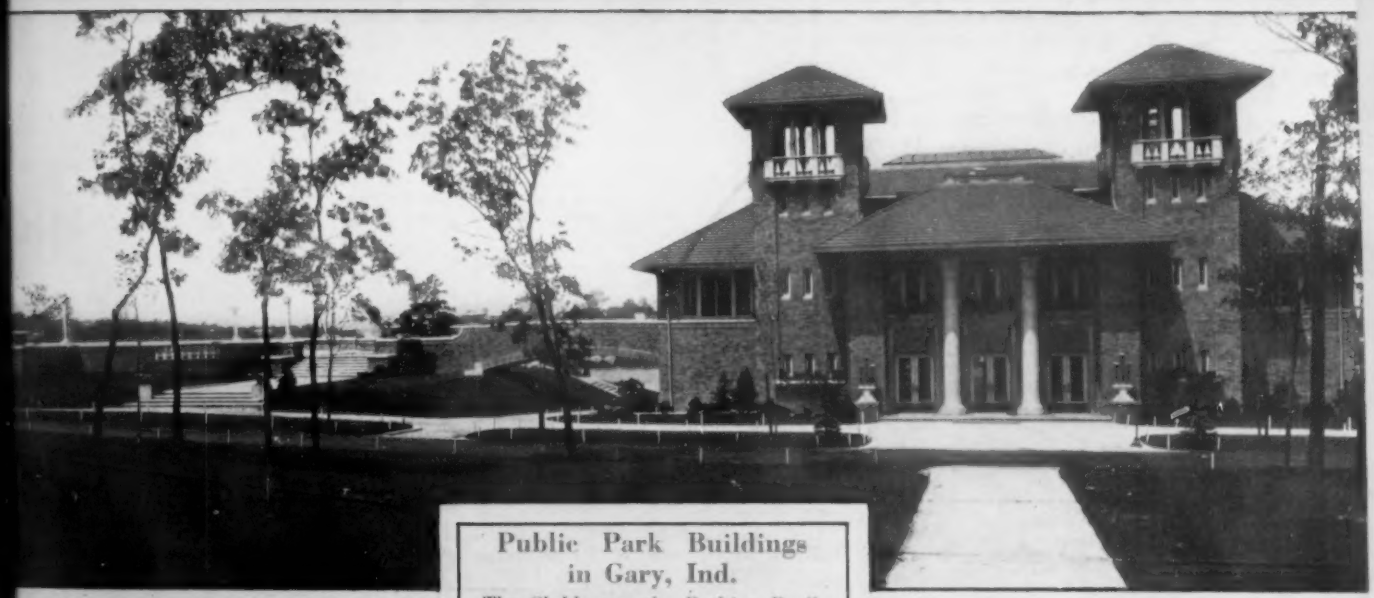

Public Park Buildings in Gary, Ind.

The Clubhouse, the Bathing Pavilion, and the Recreation Center here shown are three of a notable group described on page 94.

They struck OIL - - -

and the population of Breckenridge swelled from 800 to 12,000

Before oil was discovered in Stephens County, Texas, Breckenridge, the present county seat, was a tiny, isolated hamlet of about 800 souls, located some 35 miles from the nearest railroad. In 1918, the persistent, hopeful efforts of those who were drilling for oil in the vicinity of the town were crowned with success. A powerful stream of oil shot up through one of the wells, and Breckenridge was on its way to wealth and fame.

Today Breckenridge is a modern city of over 12,000 population. Where the nearest railroad was 35 miles away in 1918, three railroads now pass through the city. It has up-to-date hotels, and—perhaps the surest sign of prosperity—it has many miles of paved streets.

The standard paving in Breckenridge today is the "black base" type. In this form of construction, both the foundation and wearing surface are of Asphalt Concrete. In 1927, the city laid a small experimental yardage of "black base," which proved so satisfactory that during the following year 50,000 additional square yards were laid, TEXACO Asphalt being used throughout in both base and wearing surface.

Constructing TEXACO "Black Base" pavement on North McAmis Avenue, Breckenridge, Texas.

One of the TEXACO "Black Base" streets serving traffic in Brekenridge, Texas.

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The American City

Issued Monthly by the

American City Magazine Corporation

443 Fourth Avenue

New York

EDGAR J. BUTTENHEIM
President and Manager

HAROLD S. BUTTENHEIM
Editor

THEODORE R. KENDALL
Secretary and Engineering Editor

H. M. OLMSTED
M. V. FULLER
ARTHUR G. MATHEWS
MARTHA CANDLER
Associate Editors

HERBERT K. SAXE
Treasurer

PRENTICE C. FORD
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MYRON MacLEOD
Eastern Advertising Manager

Branch Offices

Tribune Tower, Chicago
TOM DIX
Vice-President

410 Hanna Building, Cleveland
GEORGE S. CONOVER
Manager

155 Montgomery Street, San Francisco
ROGER A. JOHNSTONE
Manager

Subscription Price
(To any Part of the World)
$4 per annum;
Single copies, 50 cents
Back Numbers Available

Entered as second-class matter, April 16, 1923 at the Post Office at New York, N. Y., under Act of March 3, 1879. Printed in U. S. A.

The offices of THE AMERICAN CITY are headquarters for information on equipment for municipal and county work. If you want catalogs, prices or names of manufacturers, write or wire us.

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See page preceding back cover

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Manager Plan and Proportional Representation Proposed for Philadelphia

A BILL to allow Philadelphia to adopt the city manager plan of government, with proportional representation for the election of the city council, was introduced in the Pennsylvania Legislature on February 4. The measure would take effect at the municipal election of 1931, if approved by the voters of the city before that time. A vote could be called at any regular election either by ordinance of council or by petition of one per cent of the voters.

The bill was introduced in response to a wide public demand for a fundamental change in Philadelphia's government resulting from the recent exposures of corruption in the police force. This demand was crystallized behind the manager plan and proportional representation by a suggestion of Thomas Raeburn White, made as Chairman of the Philadelphia Committee of Seventy, which received the support of the local press. The charter revision necessary to put the suggestion into effect was drafted by the Philadelphia Bureau of Municipal Research and the Proportional Representation League, under the supervision of a drafting committee of prominent citizens, and is being actively supported by a representative City Charter Committee with temporary headquarters at Room 507, 311 South Juniper Street.

As a result of the strong public sentiment that has been aroused, the bill was introduced in the Legislature by Senator Salus of Philadelphia, former President pro tempore of the Senate and stalwart member of the Vare organization, who is said to have promised to use all his influence to secure its passage.

Keeping City Officials in Touch with State Legislation

PROGRESSIVE city officials are increasingly desirious of keeping in touch with state legislation affecting their municipalities. In many states it is difficult for cities to do this, but in some states having municipal leagues or state bureaus of municipal research, legislative service has become an important function of such bodies.

The New York State Bureau of Municipal Information, for example, issues a weekly bulletin giving a summary of all bills introduced in the New York State Legislature which affect generally the administration of cities and first class villages. Copies of such bills are sent to any municipal official upon request.

All bills affecting New York State municipalities generally are carefully studied by a Legislative Committee and the recommendations of this committee are sent to the chairman of the committee to which such bills are referred. In favoring or opposing definite bills the Legislative Committee gives its reasons therefore and urges the Legislature to carefully consider these reasons. Bills affecting specific localities or groups of municipalities are not considered, but copies of such bills are sent to the cities affected.

In opposing bills especially detrimental to the best interests of all the municipalities, their representatives in the State Legislature are requested by each municipality to oppose such bills. In this way the cities and villages can muster considerable opposition to bad legislation and greatly aid in the passage of beneficial legislation.

Items and Abstracts *for* MAYORS AND CITY MANAGERS

Destroying Slums by Excess Condemnation

THE Regional Plan of New York and Its Environs calls attention to the fact that under the New York statutes, although not explicitly stated, excess condemnation may nevertheless be used as an indirect means of improving housing and destroying slum areas. A tract consisting of several streets and the land between them can be chosen; the land between the streets condemned; the streets closed, widened or changed in location; and the central portion of the land turned into a public park or utilized for some other public purpose. Excess land around the boundaries, not needed by the public, can then be sold under proper restrictions aimed to insure an appropriate building development. By proper management, this can be done at a good profit. The public use must, however, be the primary purpose of the proceedings.

Chicago Ordinance Creates Smoke Department

AN ordinance establishing a Department of Smoke Inspection and Abatement was passed by the Chicago City Council on December 19, 1928, and immediately thereafter put into effect. According to the wording of the ordinance: "The said Department shall embrace a Smoke Inspection and Abatement Commission composed of the Commissioner of Health, as Chairman, the Commissioner of Buildings, the Corporation Counsel, the Commissioner of Police, and the Chief Inspector of Steam Boilers and Steam Plants. There shall also be employed, according to law, a Deputy Smoke Inspector in Charge and such other employees as the City Council may provide in the annual appropriation."

The duties of the Commission are "to establish standards, rules, and regulations for inspection and control of the installation, reconstruction, alteration, repair, and maintenance of heating, power, and fuel-burning equipment; the prevention and abatement of smoke and noxious gases, etc." The Deputy Smoke Inspector, required to be an engineer qualified by training and experience to handle all phases of smoke control work, must—in addition to his other duties—pass upon all construction and reconstruction plans for fuel-burning plants, etc.

The ordinance has 13 sections, including sections which fix penalties for the use of new or reconstructed chimneys or furnaces without a permit; for dense smoke-emitting contrivances; for thick dust, soot, noxious gases, etc.; and for violations of any part of the ordinance.

Training Schools for New York State Municipal Employees

A COMPREHENSIVE program for the training of all groups of municipal officials and employees was adopted at a recent meeting of the Advisory Committee of the Conference of Mayors and Other Municipal Officials of the State of New York. Ten years will be required for putting into effect the complete schedule, which calls for the establishment of training facilities for health, fire, charities, and financial officials, civil service employees, water bureau superintendents, purchasing agents, city and village clerks, park officials, and assessors. The Conference has plans already under way for the training schools for fire department and charities department employees similar to those now being organized for police training as described in THE AMERICAN CITY, November, 1928, page 107, and the training of health officers is being taken care of by the State Health Department.

Twenty-three Municipalities Have Set Out 12,125,000 Trees

EXCELLENT progress in reforestation of publicly owned watersheds, is reported in a study just completed by the New York State Bureau of Municipal Information. The study is based on a comparison of reports received by the Bureau in 1921 and during November, 1928. The cities and first-class villages of the state own approximately 180,000 acres of watershed, nearly one-half of which is now forested. Twenty-three municipalities have set out 12,125,000 trees. In addition, considerable land was wooded when acquired.

The reports just received show that fourteen municipalities have reforested practically all of their watersheds and that all others owning a watershed capable of being reforested are now planting trees annually. When the Bureau made its study in 1921 and, with the State Conservation Commission, prepared a report on the benefits a city received from such work, less than a dozen municipalities were doing intensive reforesting work.

The Bureau's bulletin which was sent last month to all cities and first-class villages, says: "A municipality should begin to receive revenue from its reforested watershed after forty years. If Christmas trees are grown for thinning, it will begin to receive revenue much sooner. An acre of forest should yield at least 500 board feet of timber per year, and more under favorable conditions. This may be conservatively estimated as worth at least $15 per 1,000 board feet on the stump."

Page from January issue of American City.

It will do the same for your town

Steel Storage Tank Improves the Water Service of Royal Oak, Mich.

By R. J. WHITNEY
City Manager, Royal Oak, Mich.

THE NEW 1,500,000 GALLON ELEVATED TANK AT ROYAL

...ity of Royal Oak re... completed the con... of a 1,500,000-...ted steel stor... ...e overflow ...et above ... tank ... of ...

...inch at the top to ¼-inch at the balcony line, and below the balcony line the thickness is 1 inch. The 10-foot diameter cylinder is made of ½-inch-thick steel plates. There is a very interesting structural detail adjacent to the top of the 10-foot cylinder where the ellipsoidal bottom is attached to the cylinder. It is estimated that the 10-foot cylinder carries the portion of the tank and water of approximately 17 feet in diameter extending to the top of the tank. The total thickness of the steel at the bottom of the tank for a distance of over 3 feet radiating from the top of the 10-foot cylinder is practically 3 inches, built up of plates curved to fit the cylindrical support and the ellipsoidal bottom of the tank.

A 12-inch-diameter overflow pipe extends from the top of the tank to the foundation and connects with the sewer. There is a steel ladder inside the tank from the foundation to the top, and another on the outside from the foundation of the roof. Both ...n the inside and the outside of ... cylindrical portion of the ... above the balcony, there ...ers on trolleys which are ...for painting the tank. ...ecial revolving roof ... to a 20-inch ... finial to be ...e roof. ...ected to ...8-inch ...th.

...this ... "Roya... the tank ...

The tank ... and 60 feet hig... ing cylindrical and ... soidal. From the fo... derside of the tank, ... feet, the water rises thr... diameter cylinder. This cy... upon a concrete foundation ... tends 12 feet into the ground, is oc... in shape and 29 feet in diameter at ... base. The tank is further supported ... 16 columns fabricated from 14-inch ... 228.5-pound Bethlehem H-sections which ... rest on concrete pedestals. The pedes- ... tals are supported by a concrete mat 2 ... feet thick and 16 feet wide. This mat ... is circular in plan, centered with the ... columns above. The total weight of the steel plates. ... foundation is 3,000,000 pounds. The ... in the tank ...

NOT every town of 7,000 population needs a 1½-million-gallon tank. But small cities are finding economy in tanks larger than were ordinarily considered a few years ago.

And the use of tanks is not limited to small cities. The same advantages apply in metropolitan areas. Let us give you examples of Horton Tanks that are serving cities like yours.

CHICAGO BRIDGE & IRON WORKS

Chicago	2127 Old Colony Bldg.	Philadelphia	1616 Jefferson Bldg.
New York	3108 Hudson Terminal Bldg.	Dallas	3306 Magnolia Bldg.
Cleveland	2236 Union Trust Bldg.	Atlanta	1014 Healey Bldg.
Detroit	1501 Lafayette Bldg.	San Francisco	1033 Rialto Bldg.
Havana, Cuba	Apartado 2507		

HORTON TANKS

AC3-Gray

Items and Abstracts on WATER AND SEWERAGE

Soil Corrosion Studies of the U. S. Bureau of Standards

THE Bureau of Standards has issued a preliminary report on the results of its soil-corrosion studies, started in 1922, which contains a large amount of valuable information for engineers, particularly those connected with public service organizations. The investigation is being carried on in cooperation with manufacturers, public utility corporations, several governmental departments, and the various interested technical societies. The materials considered in the investigation include various kinds of steel, cast steel, cast iron, wrought iron, wood fiber, lead, brass, copper, bronze, aluminum, zinc, and pipe, as well as metallic and non-metallic coatings for steel and iron. There were approximately 14,000 specimens buried in 47 different types of soil. At present only 2,000 of these specimens have been removed, and therefore this report is only a preliminary indication of the final results. Specimens are being removed at two-year intervals, and so the investigation will probably not be completed for some years.

The specimens in general consist of short lengths of pipe ranging from 1½ to 6 inches in diameter and 6 inches long. Specimens were removed from the test soils at intervals of approximately two years, and were classified in accordance with the loss of weight due to corrosion and the depth of the corrosion. The data obtained up to the present indicate the following:

1. Corrosion depends upon the type of soil. Well-drained, coarse-grained soils show less corrosion than wet, silty soils. The most corrosive soils were those with a high per cent of sulphates (white alkali) and heavy soils with a slight acid reaction.

2. The majority of soils have a low rate of corrosion. In some cases it is practically negligible, while several soils have appreciable corrosion.

3. The type of corrosion differs from the several soils. In alkali soils corrosion occurs in large patches; in heavy, clayey soils it took the form of small pits; and in one soil the specimen appeared as if worm-eaten.

4. The rate of corrosion appears to decrease with the time of exposure.

5. No one ferrous material appears to be superior to all others for use in all soils.

6. Bituminous coatings in general do not furnish sufficient protection against corrosive soil conditions.

7. Copper and its alloys corrode very slowly. Lead and zinc pit badly in some soils, and aluminum very rapidly in certain soils.

A Great Engineer

IF one were seeking a subject for a monument in New York City, it would be found in the person and achievement of J. Waldo Smith, through whose engineering skill and direction the daily water-supply was brought from the hills to 6,000,000 inhabitants. He has been again and again recognized by his brother engineers, and notably by the American Society of Civil Engineers, who have just bestowed upon him their highest honor. But every man, woman and child should know of the unique service of this New England farm boy, who was chief engineer of the water-works consisting of a pump and two miles of pipe in the little town adjoining the farm, when he was but 17 years old, and who, before he got through, had accomplished an engineering feat, as General Goethals himself said, greater and more difficult than building the Panama Canal.

Underwood & Underwood

J. WALDO SMITH

His real monument is under ground, a part of its long way from the Catskills nearly a thousand feet down. There should be, somewhere in the city which that underground stream nourishes and refreshes, some visible expression of gratitude to the man who led this modern Alpheus under the Hudson and brought it to the surface again. The old Greek Arethusan myth has been remembered for ages, even though its miracle does not compare with this enterprise of the modern engineer. The Roman aqueducts, which bore their streams chiefly above ground, have compelled the admiration of centuries long after they fell into disuse. But this New York achievement is likely to be forgotten even by the generation that has seen its completion, unless marked in some memorable way. Its story should be told and retold to the school children till it becomes a part of the conscious possession of coming generations.

Mr. G. K. Chesterton, in one of his essays, says that the name 'Smith" is so poetical that it must be "an arduous and heroic matter" for the man who bears it to live up to it. Mr. J. Waldo Smith has lived up to its highest traditions, working in his underground smithy, where a way has been made by him by which springs of water reach every tenement, apartment, mansion and skyscraper in this vast cosmopolis. Without such men and such engineering skill "shall not a city be inhabited and men shall not sojourn or walk up and down therein."

—*New York Times.*

Coarse and Fine Screens in Sewage Treatment

COARSE screens are generally placed in front of pumps, fine screens or other devices requiring protection from large floating material that might cause injury. The usual form is the inclined rack of parallel bars spaced up to 5 inches apart and cleaned by hand, but in large installations mechanical equipment is desirable. At the North Side works, Chicago, at Milwaukee, and at the South Side plant at Houston, cage screens are used in pairs, one being in service while the other is raised by power and cleaned by hand. These screens are adapted to large flows and deep sewers, when the limited amount of manual labor is justified.

At the West Side works, Chicago and the Hyperion plant, Los Angeles, the Dorrco coarse screen is used. This is simple in design and mechanically operated, the curved rack being cleaned by a rake connecting the outer ends of radial bars rotating on a horizontal axis. This is a revival of a type of screen used in Germany and may well be adapted to many situations.

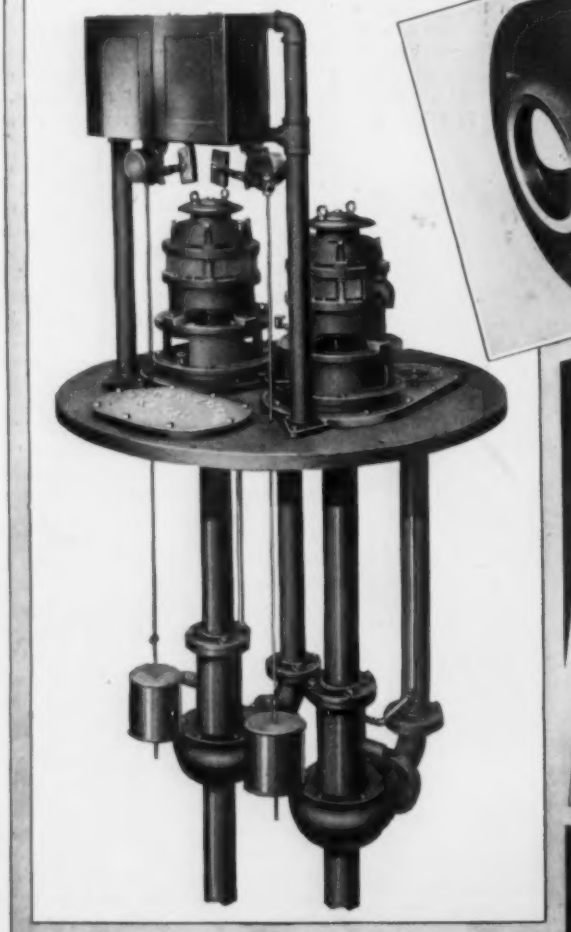
Fine screens of the Reinsch-Wurl type are in use at the Des Plaines River works, Chicago, of the Tark or Link-Belt type at Milwaukee, of the Dorrco type at Lodi, Pasadena, Long Beach and Los Angeles, and of the Hurd type at Indianapolis. Those at Chicago and Milwaukee, Lodi, Pasadena and Indianapolis furnish preliminary treatment for the activated sludge process, while at Long Beach and Los Angeles their function is to protect nearby bathing beaches. The Milwaukee, Indianapolis and Los Angeles installations are important as to size and are excellent examples of their kind. In general, the trend seems to be in favor of slotted plates rather than wire mesh and with 1/16 x 2-inch slots.

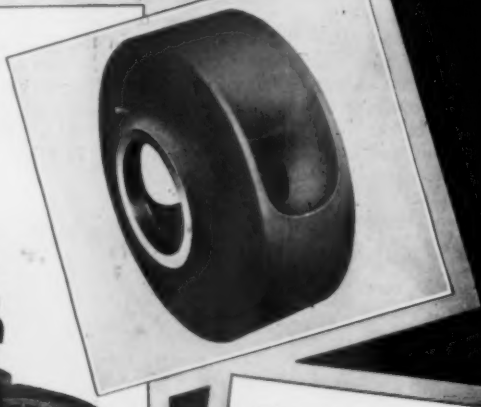
In choosing a fine screen, it would seem that too much stress has been laid in the past on the efficiency as shown by short tests. Reliability of performance, durability and cost of upkeep are believed to be matters of much more importance, and concerning these information is gradually accumulating with longer experience.

The disposal of screenings by burying in small quantities and in rural areas is often the simplest and best method.

—Prepared from a report on methods of sewage treatment, made by the Comptroller and the Chief Engineer to the Board of Estimate and Apportionment, New York.

RAW SEWAGE PUMPS





Byron Jackson Sewage pumps are designed for either wet or dry pit operation, and will pass any solid that can enter the pump. The shaft is protected from contact with the fluid pumped by an enclosed column which also supports the weight of the pump. The two port impellers [illustrated at the right] insure maintained efficiency and freedom from shutdown. The oversize bearings are lubricated from the surface and are protected from pressure fluid by special arrangement of ports.

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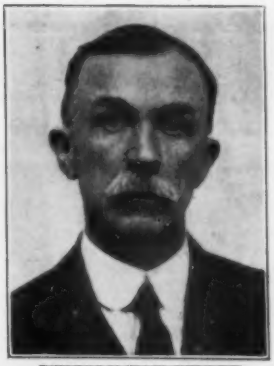
BYRON JACKSON

CENTRIFUGAL PUMPS FOR EVERY SERVICE

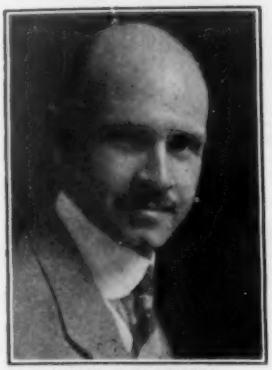
W. T. BANNING
Supt., Light & Water Commission, Milford, Del.
(Appointed 1893)



LINCOLN VAN GILDER
Eng. & Supt., Water Dept., Atlantic City, N. J.
(Appointed 1908)

ALVIN BUGBEE
Supt., Water Dept., Trenton, N. J.
(Appointed 1904)

DAVID P. RAWSON
Supt., Water Department, Bloomfield, N. J.
(Appointed 1925)



ALBERT S. BLANK
Supt., Water Department, Belleville, N. J.
(Appointed 1924)

WHO'S WHO IN WATER SUPPLY

Installment No. 13—Portraits of Water-Works Officials in Twelve Cities of New Jersey and Two Cities of Delaware

ANDREW B. MAUEY
Water Conservator, Jersey City, N. J.
(Appointed 1921)

CHARLES H. MORRIS
Supervisor, Water Dept., New Brunswick, N. J.
(Appointed 1915)

THOMAS CAMPBELL
Water Purveyor, Water Dept., Kearny, N. J.
(Appointed 1922)

JOHN W. PURSGLOVE
Chief Engr., Water Works, Gloucester, N. J.
(Appointed 1923)

PETER H. GLANNAN
Supt., Commonwealth Water Co., West Orange, N. J.
(Appointed 1913)

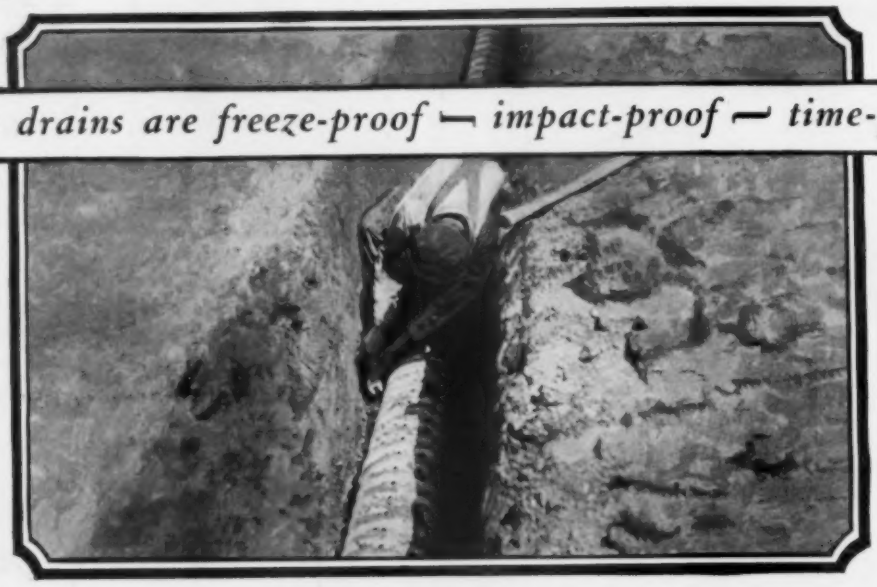
ROSWELL M. ROPER
Engr. & Gen'l Mgr., Water Dept., East Orange, N. J.
(Appointed 1918)

CHARLES W. DARE
Commissioner of Public Wks. Bridgeton, N. J.
(Appointed 1928)

JOHN C. SCHLICHT
Supt. of Construction, Hackensack Water Co., Weehawken, N. J.
(Appointed 1929)

S. N. VAN TRUMP
Chief Eng., Water Dept., Wilmington, Del.
(Appointed 1918)

These drains are freeze-proof — impact-proof — time-proof



"We installed our drains— Once and for all"

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Light in weight

Quickly Installed—
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ARMCO *perforated* PIPE

Road Development Has Lagged in India

IN the middle of the sixteenth century, the Emperor Sher Shah built a highway from the Punjab to the city of Sunargaon, now known as Calcutta, and a few main roads were later constructed by military boards for army purposes, but it was not until a Public Works Department was organized in 1855 that an era of roadmaking in the modern sense may be said to have commenced in India, according to a report of Charles G. Spofford, Jr., U. S. Trade Commissioner. It was about this time that the influence of railways upon the construction of substantial roadways began to make itself felt. As the railway system developed, it became increasingly necessary to build roads to feed the railways rather than to compete with them, and this in turn led to a demand, which remains today, for bridges and surfaced roads which would give access to the railways throughout the year.

As a result of this stimulus from the extension of railways, about 225,000 miles of surfaced and unsurfaced roads now exist in British India and perhaps a further 25,000 miles of roads exist in the Indian States, but the country is still insufficiently provided with communication. In spite of the development of the last half-century, India must still be regarded as a backward country in respect to railways and roads.

Highway Development Similar to Railroads

THE development of highway transportation is progressing in the same manner that railroad transportation progressed. The first thing undertaken was the construction of the main railroad lines. In order that the main lines might serve the whole country, it was necessary to construct branch lines or feeders to the main lines, so that commodities and passengers could be carried to and from all sections of the country.

Today highway transportation has not reached this advanced stage. There are very few localities where feeders to the main lines have been constructed, the result being that in localities having earth roads, passengers and commodities can be transported to the main highway only at certain seasons of the year when the roads are passable. It will be necessary not only to provide hard-surfaced pavements on these earth roads so that they will be passable all the year, but new roads must be projected in many sections of the country before the highway transportation system is as well-rounded and self-contained as the railroad transportation systems throughout the country.

The completion of this highway system will provide a combined railroad and highway transportation system that will enable this country to develop all its resources to the fullest extent and thus add very materially to the national wealth.

—Abstract from the report of the investigation of paving and general highway conditions by the Engineering Commission of the National Paving Brick Manufacturers Association.

Items and Abstracts *for* ENGINEERING AND HIGHWAY DEPARTMENTS

Savings in Relocation of Highways

WHILE the economics of road surfacing is a very important factor, the economics of highway location is also of very considerable importance. The highways, like the railroads, lead from one center of population to another. The best routes, in particular, should be located with a view to carrying the traffic to and from the different centers of population by the shortest ways and over roads with reasonable grades and curvatures for motor transportation. Most of the old roads were laid out for local horse-drawn traffic and without much consideration to selecting the shortest route between distant points. Old highways, therefore, are not as a rule in economic locations.

The average motor transportation costs of highway users for each 1,000 feet over a hard-surfaced road is approximately $0.023 for each vehicle. The cost, therefore, of 1,000 vehicles a day would be $23, or $8,395 per year, or approximately $167,900 over a period of 20 years. This clearly indicates the necessity of shortening the distance when practical or on a through-route highway. Many relocations are made which result in shortening the distance over a mile. Based on the figures stated, the savings to the users in transportation costs for each mile would be approximately $44,300 per year, or $886,000 over a period of 20 years. These figures are based on 90 per cent passenger traffic and 10 per cent truck traffic.

On the Pennsylvania State Highway system, the relocations from January 14, 1923, to January 1, 1928, have resulted in a saving of approximately 170 miles. With an average traffic of 1,000 vehicles per day, the saving in operation costs is approximately $7,500,000 per year. To this should be added $800,000, which is the average annual cost of 170 miles of pavement, and is made up of the interest on the investment, sinking-fund requirements for bond issue, and the maintenance costs, making a total annual saving of $8,300,000 per year due to reducing the distance on the Pennsylvania State Highway system. In other words, if this distance were not saved by constructing the highways on the economic location, this sum would represent an annual loss to the public.

The policy of relocating through-route highways with a view to providing the logical shortest route, often eliminates minor centers of population and sometimes leads to a sacrifice of local interests for the general good.

—From the report of the investigation of paving and general highway conditions of the Engineering Commission of the National Paving Brick Manufacturers Association.

Types of Highways Adopted in Tennessee

THE Tennessee State Highway Department has adopted three types of road surfacing which it believes will take care of traffic of every description within the state. These are divided into high types, intermediate types, and low types.

The high type road is made upon subgrade, according to the most exacting engineering principles, at a cost of $28,000 to $38,000 per mile, depending upon local conditions, most of all upon materials, etc. This cost may be divided into two parts: from $10,000 to $15,000 per mile for the grading and draining, including small bridges; and $18,000 to $23,000 per mile for a standard 18-foot pavement, which is either a concrete slab or a concrete base asphaltic surface type.

The intermediate type includes the 3,000 miles of roads which have been taken over from the counties. These roads have a good macadam base, and are capable of carrying traffic economically. The roads are fairly well located and fairly well drained, representing an average highway value of $5,000 per mile. Under the increasing traffic demand, and under the constant effect of erosion, these roads develop expensive maintenance costs, for the traffic exceeds 300 cars per day.

The State Highway Department has developed effective means of putting semi-permanent surface upon these roads at a nominal cost, and is now treating a large mileage with an application of either tar or liquid asphalt combined with a suitable admixture, at an average cost of $2,200 per mile. This treatment not only provides a much smoother and more comfortable riding surface, but also eliminates the dust, which makes for the comfort not only of motorists, but also of the citizens who reside along the roadside.

During 1928 the roads of Tennessee suffered very heavy storm damage, the majority of which was to gravel roads, while the treated roads in the same storm area suffered little. These and other facts have caused the Department to look with much favor upon the surface treatment of roads not designated as trunk line highways.

The low type of road surface comprises the gravel, crushed stone or dirt roads which are built where the traffic count will average less than 300 cars per day. Wherever gravel or stone surfacing material is available at reasonable cost, it is always used, but in some sections of west Tennessee such material is not available locally. Consequently, there are still several hundred miles of dirt roads which the State Highway Department has not as yet surfaced with gravel, but it is expected that within the next two years the system will be brought up to the point where dirt roads will be entirely eliminated.

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FI-2

FRED E. WILSON
County Engr., El Paso County,
El Paso, Texas
(Appointed 1924)

ALBERT J. WISE
County Engr., Harris County,
Houston, Texas
(Appointed 1917)

R. H. CLINGER
County Engr., Dallas County,
Dallas, Texas
(Appointed 1925)

JOHN W. RYDER
County Engr., Potter County,
Amarillo, Texas
(Appointed 1927)

G. B. SANDAGE
County Surveyor, Cleburne Co.,
Heber Springs, Arkansas
(Appointed 1928)

WHO'S WHO IN COUNTY ENGINEERING

Installment No. 5 of Portraits of County Engineers and County Surveyors

JAMES R. WENDT
Parish Engr., Bossier Parish,
Benton, La.
(Appointed 1925)

E. N. GUSTAFSON
County Engr., Matagorda Co.,
Bay City, Texas
(Appointed 1927)

WILLIAM RADICAN
County Surveyor, Prairie Co.,
Des Arc, Arkansas
(Appointed 1913)

FRANK F. KORESKY
County Surveyor and Engr.,
Clark Co., Arkadelphia, Ark.
(Appointed 1923)

W. O. WASHINGTON
County Engr., Cameron County,
Brownsville, Texas
(Appointed 1920)

A. A. McPHERSON
County Highway Engineer,
Aitkin County, Aitkin, Minn.
(Appointed 1927)

FREDERICK WHEELER
County Engr., Hardin County,
Elizabethtown, Ill.
(Appointed 1925)

JOHN F. EASTER
County Surveyor, Castro Co.,
Dimmitt, Texas
(Appointed 1908)

WILLIAM W. McLENDON
County Engr., Navarro County,
Corsicana, Texas
(Appointed 1927)

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Items and Abstracts *for* PARK AND PLAYGROUND DEPARTMENTS

Two Summer Schools of Recreation and Physical Education in the Big Outdoors

THE Department of Physical Education of New York University, under direction of Prof. Jay B. Nash, has announced summer school courses to be taught at the New York University Camp in Palisade Interstate Park, N. Y., and at Chautauqua, N. Y., July 1 to August 9, 1929. These will include professional training for administrators of physical education, recreation, and camp methods, administration of teacher training, educational sociology, history of education, health teaching, hygiene, life saving, achievement and efficiency tests, coaching team games, nature study, boating and canoeing, dancing, handcraft and swimming. All courses at both camps may be made to count toward degrees.

Courses at New York University Camp are especially designed for graduate students and for those who hold positions in teacher-training institutions, or who are in administrative positions in physical education, recreation, or camping. Detailed information concerning this camp will be supplied upon request to Prof. Milton E. Loomis, Director of Summer School, New York University, Washington Square, East, New York City. The courses at Chautauqua Physical Education Camp are especially designed for teachers of physical education, elementary teachers, school administrators, and others interested in physical education, recreation and camping. Charles E. Peirce, Secretary of Instruction, Chautauqua Summer Schools, Chautauqua, N. Y., will send further details upon application.

Easter Celebrations in the Union County Parks

THREE thousand men, women, and children braved the stinging wind and the biting temperature of lingering winter to join in the Sunrise Service held on Easter Sunday morning last year in Warinanco Park Stadium, Elizabeth, N. J., Union County Park System. As the sun's first rays, flamed above the eastern horizon, they were greeted by the caroling of the vast chorus.

The service was broadcast by station WTBS and enjoyed by thousands in their homes. The program was under the auspices of the Elizabeth Y. M. C. A. The cooperation of the churches was naturally had, making it the great success that it was.

A similar program was conducted by the Plainfield Y. M. C. A. in Green Brook Park, at Plainfield. The interest and the enthusiastic participation in both of these observances has naturally prompted both groups to hold similar services this year. It is expected that even larger numbers will take part.

According to F. S. Mathewson, Superintendent of Recreation, Union County Park Commission, another large-scale Easter celebration held in Green Brook Park last year, and to be repeated this year, was the Easter Egg Hunt, held under auspices of R. O. Schlenter, Plainfield Recreation Commission. Boy and Girl Scouts assisted in hiding 1,400 colored eggs. The area was divided into four sections, three for the children of different age groups, and the fourth for crippled children. When the signal guns were fired, 3,000 happy youngsters rushed forward to the hunt. Hundreds of children searched long after all of the eggs had been found. The eggs were freshly made of candy, of natural size, and each wrapped in waxed paper. There will be twice as many eggs hidden this year in Green Brook Park, and the Recreation Department of the Union County Park Commission will hold an Egg Hunt in Warinanco Park. For this the *Elizabeth Daily Times* is donating about 3,500 eggs.

A Department That Promotes "a Community Spirit of Brotherhood"

THE Playgound Department of Columbia, S. C., maintains an extension division which organizes hiking clubs, promotes and assists in the development of back-yard playgrounds, and runs a free library at one of the playgrounds. It provides a community visiting service, takes direction of the Girl Scouts organization, supervises Better Films matinees, and cooperates actively with other cities in the state and in neighboring states in playground development and administration.

This extension service is only one of the many divisions of the local Playground Department's activities described in the 1928 annual report just issued. Organized athletics with track and field events; competitive games for youngsters of all age-groups; tournaments in horseshoe pitching, quoits and croquet; tournaments in marbles, jackstones, sand modeling; soap bubble blowing; contests in push-mobile racing, sail boating, kite flying and stilt walking—these are a few of the activities featured. Music and dramatics are also reported as highly organized, and art exhibits of the year are reported to have included the display of a model playground at the state fair.

The Department provides free programs for social evenings, picnics, and parties and conducts activities for organizations. It also organizes city-wide celebrations of the principal holidays, these services being in keeping with the policy which, as described by Robert Moorman, Jr., Councilman and Superintendent of Playgrounds, and Adele Johnston Monahan, Supervisor, is that the Department "with its playgrounds, equipment, play directors, and executive body, is at the disposal of the entire community for the purpose of assisting in the development of a wholesome, constructive program of leisure-hour activities—a program that will substitute initiative and activity for idleness, healthful character building for selfish inharmony, and promote a community spirit of brotherhood necessary for the program of 'A City with a Soul.'"

Two Notes from Mining Centers

A BEAUTIFICATION policy officially adopted by the owners of 51 zinc and lead mines in and around Picher, Okla., has had a direct effect upon the morale of the workers,—and more, actually has yielded financial returns in an indirect but no less certain way. Since all old eyesores have been transformed into beauty-spots, since slag piles and dump heaps have become gardens, the officials report, there is a noticeable decrease in carelessness and slovenliness and in resultant accidents.

Almost coincidentally with the appearance of the Associated Press report of this triumph of an esthetic idea in an industrial center, appeared a news account in strong dramatic contrast from another mining center, Mahanoy City, Pa. A mine cave-in wrecked a municipal playground and swimming pool, which represented an investment of many thousands of dollars and improvements extending over a period of ten years. The walls of the $10,000 swimming pool were torn apart, causing the corner of the grandstand to sag, and opening a fissure down the middle of the concreted athletic field.

Making Airports Attractive

THE landscaping of airports is a new field which will probably require some experimenting before principles can be ascertained and stated. However, there are certain obvious things that can be said, based on the general demands of the problem. First of all, trees are not wanted. The aviator must have a clear field for landing and taking-off. The planting will, then, be limited to shrubs, flowers and grass. Even the shrubs would be of the less woody types. Low shrubs, bright-colored flowers in masses, and grass, may be used to help the aviator distinguish the outlines and location of the field as well as to beautify the area for those seeing it from the ground. The rapidity with which the airplane is becoming a new mode of travel means that there will be demands for airports to be made more attractive, as soon as the practical, utilitarian needs are met.

—From a paper by George W. Braden, Western Representative, Playground and Recreation Association of America, presented at the American Institute of Park Executives' Convention, 1928.

See Also

pages 94, 103, 112, 122 and 147 for interesting and valuable material on recreational features and facilities.

TWENTY-FIVE years of continuous use of the voting machine by Buffalo, Syracuse and Rochester demonstrate convincingly its durability, efficiency and economy. Elections, both national and local, have been more easily handled .... returns compiled and results known almost immediately after the close of the polls.

And now, New York and San Francisco are included among the 2,000 cities and towns that have installed voting machines in place of the old-fashioned paper ballot.

Such widespread adoption is the strongest possible testimonial to the merits of the voting machine.

Let us demonstrate how your city or county can save money by using the voting machine. A request for facts involves no obligation. Write for Booklet A-6.

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MANUFACTURERS OF
VOTING MACHINES

Municipal Power to Establish Airports Upheld in Three Decisions

ALMOST simultaneously the highest courts of New York, Missouri and Oregon have promulgated opinions upholding the establishment of airports as a legitimate municipal function.

In the New York case—Hesse vs. Rath, 164 N. E. 342—the validity of a law enacted in 1928, authorizing New York cities to establish airports, was attacked as contravening a prohibition against the incurring of city debts except for "city purposes." With remarkable brevity, an opinion filed by the New York Court of Appeals in this case December 7, 1928, observes:

"We think the purpose to be served is both public and municipal. A city acts for city purposes when it builds a dock or a bridge or a street or a subway. . . . Its purpose is not different when it builds an airport. Wichita v. Clapp, 125 Kan. 100, 263 P. 12. Aviation is to-day an established method of transportation. The future, even the near future, will make it still more general. The city that is without the foresight to build the ports for the new traffic may soon be left behind in the race of competition. Chalcedon was called the city of the blind, because its founders rejected the nobler site of Byzantium laying at their feet. The need for vision of the future in the governance of cities has not lessened with the years. The dweller within the gates, even more than the stranger from afar, will pay the price of blindness."

January 8, 1929, the Oregon Supreme Court upheld the right of the city of Roseburg to issue bonds for an airport, as being for a proper "public purpose." (McClintock vs. City of Roseburg, 273 Pac. 331.) After referring to the rapid development of transportation by air, the Court remarks:

"The only way an aeroplane company could acquire a monopoly would be through monopolizing the airport. It would seem, therefore, that airports may be properly owned and controlled by a municipality or other public corporation."

The Court cites the Kansas and New York decisions as supporting its conclusions; also the case of State vs. Johnson, 220 N. W. 273, decided by the Nebraska Supreme Court, June 27, 1928.

December 8, 1928, the Missouri Supreme Court pronounced its holding in the cases of Dysart vs. City of St. Louis, 11 S. W. (2d) 1045, and Ennis vs. Kansas City, 11 S. W. (2d) 1054. The decision is the same as that rendered by the Oregon Court—that an airport is a "public purpose" for which city indebtedness may be incurred.

County Platting and Zoning Legislation Advocated for Illinois

TO make possible coordination of use zoning in cities and villages with that of unincorporated areas is the aim of a proposed County Zoning Act which will be sought in the 1929 session of the Illinois State Legislature.

A tentative bill outlining the desired legislation has been formulated by the officers and directors of the Chicago Regional Planning Association in cooperation with the Illinois Association of Real Estate Boards.

The purposes of the proposed act, as outlined by the Chicago Regional Planning Association, are:

1. To coordinate the development of cities, villages and incorporated towns lying within the same county, through a plan as to territory lying between or contiguous to such incorporated areas.

2. To protect incorporated communities from non-conforming uses just across the border.

3. To bring into a uniform plan regulations that may now be imposed by cities upon territory outside of their borders with respect to city plans and location of cemeteries and offensive businesses.

4. To authorize cooperation among counties and of counties with other municipal corporations for the promotion of these purposes.

Items and Abstracts *for* FINANCE AND LEGAL DEPARTMENTS

250 Cities Spend More Than Three Billion Dollars Annually

A SUMMARY of the financial transactions of 250 cities having a population of over 30,000 for the fiscal year 1927, just released by the Department of Commerce, shows total payments by these 250 cities during that year of $3,324,386,351. The main divisions of this total are as follows:

Operation and maintenance of general departments of city government	$1,750,707,093
Operation of public service enterprises, such as water-works, electric light plants, etc.	162,470,940
Interest on debt	319,248,702
Outlays for permanent improvements, including those for public service enterprises	1,091,959,614

The governmental cost payments for expenses of municipal departments of these 250 cities, classified under ten main headings, have been published in THE AMERICAN CITY for December, 1928, and January and February, 1929. The averages for the five population groups into which the Bureau of the Census classifies these cities will be published in the 1929 Municipal Index.

The Municipal Bond Market

By SANDERS SHANKS, JR.
EDITOR, *The Bond Buyer*

FROM the standpoint of the borrowing municipality, conditions in the municipal bond market during the past month have not been very satisfactory. Prices on high-grade issues have moved even lower, as evidenced by the recent sales by East Orange, N. J., and White Plains, N. Y. East Orange sold several blocks of improvement bonds aggregating $2,727,000 at prices which indicate a net interest rate of about 4.42 per cent. White Plains was able to obtain money for general improvements and schools on a little better basis, its $2,815,000 issue being placed at a net rate of 4.27 per cent. Other representative issues have been sold at correspondingly low prices.

Were it not for the fact that many municipalities have been holding issues off the market in anticipation of an early improvement in bond prices, it seems clear that the decline would have extended even further than it has. The investment demands of insurance companies, savings banks and trust funds also have helped to counteract the unfavorable conditions created by the diversion of idle funds into speculative securities. If money conditions do not improve in the near future, it is quite likely that many municipalities that have been withholding their bonds from the market may be obliged to offer them for sale, which of course would have the effect of forcing market prices even lower.

The following list of representative issues indicates the trend of the municipal bond market at the present time:

Amount	Issue	Rate (%)	Maturity	Basis
$400,000	Lynn, Mass.	4	1-15-Yr.-Ser.	3.95
1,175,000	Hawaii	4¼	5-29-Yr.-Ser.	4.24
650,000	Omaha, Nebr.	4 & 4½	20 & 10-Yr.	4.25
33,690	Marion Tp., Ind., Sch. Dist.	5	8-Yr.-Avg.	4.34
8,300,000	Cleveland, Ohio	4 & 4½	13 2/3-Yr.-Avg.	4.374
185,000	Indianapolis, Ind., Sch. Dist.	4½	2½-Yr.-Avg.	4.44
265,000	Horseheads, N. Y., Union Free Sch. Dist. No. 4	4½	11¾-Yr-Avg.	4.44
35,000	Olympia, Wash.	4½		4.50
500,000	Tulsa, Okla.	4½	5-21-Yr.-Ser.	4.50
157,000	Hopewell Tp., N. J., Sch. Dist.	4¾	15½-Yr.-Avg.	4.52
360,841	Portsmouth, Ohio	4½ & 4¾	6¾-Yr.-Avg.	4.61
1,300,000	Greater Greensboro, Sch. Dist., N. C.	4¾	18 5/6-Yr.-Avg.	4.66
45,000	Arcadia, Calif.	5	15½-Yr.-Avg.	4.67
435,000	Jacksonville, Fla.	5	13½-Yr.-Avg.	4.73
150,000	Swoyerville, Pa.	5	6-20--Yr.-Ser.	4.82
50,000	Independence, La.	6	13½-Yr.-Avg.	5.16

A Monument to Civic Pride — *a Custodian of Health*

Where her richest, proudest avenues converge to form a square the city sets a stone, and on it rears a monument to her patriot sons.

In quite another quarter she erects a building that is no less a monument to her civic pride, though it be utilitarian to the last degree. That building is her Sterling Destructor plant, her means of sanitary waste disposal.

No city that possesses a Sterling Destructor but holds her head a little higher for that fact, for her air is clean. The Mutual-cell Furnaces of a Sterling Destructor burn both garbage and refuse, and in the burning completely oxidize the resultant gases, and leave only a little sterile ash.

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Items and Abstracts *for* CIVIC AND COMMERCIAL ORGANIZATIONS

Forum on County Government Held by Cincinnati Groups

THE Woman's City Club, the League of Women Voters and The Cincinnatus Association, all of Cincinnati, conducted a "Forum on County Government" in that city on January 10.

Three sessions were held—morning, luncheon and afternoon—at which prominent speakers discussed various phases of county government. Under the general heading of "The Relation of Municipalities to the County," Mayor Murray Seasongood of Cincinnati discussed "Public Works and Regional Planning," Mayor Harry H. Baker of Norwood, Ohio, talked on "Public Finance," and Mayor James H. Cleveland of Glendale, Ohio, delivered an address on "Criminal Justice."

The work of the Board of County Commissioners of Hamilton County was outlined by its President, Clifford Brown, while Samuel Ach, the County Treasurer, spoke on "Personnel Problems in County Government." "Public Administration in Metropolitan Counties" served as the subject of the luncheon address by Prof. Charles E. Merriam of the University of Chicago. The final session was featured by addresses on "What the State Legislature Can Do to Improve County Government," by R. E. Miles, Director of the Ohio Institute at Columbus, and "Remodeling County Government-Constitutional Possibilities," by Emmett L. Bennett, Director of the Municipal Reference Bureau of the University of Cincinnati.

Voting Machine Used for Chamber Election

AN interesting innovation in the annual election of directors of the Chamber of Commerce at Shreveport, La., during January was the utilization of an automatic voting machine for the balloting.

The machine was of the same variety as those installed in various cities for the presidential election last November and was loaned to the Chamber of Commerce by the Automatic Registering Machine Co., Inc., of Jamestown, N. Y. Since there are approximately 1,100 members of the Chamber, the introduction of machine voting saved considerable time. There were 28 names listed and the machine was so regulated that only 14 directors, the number necessary to complete the board for the ensuing year could be voted for by each member.

The Chamber of Commerce installed the machine chiefly to inform members concerning its advantages and to attract the attention, also, of the general public.

Printer Members Print Program for Chamber

A VERY attractive souvenir program and booklet was printed by the Printers' Council of the Pittsburgh Chamber of Commerce for the annual dinner and meeting of that organization on Lincoln's Birthday.

The foreword to this unique leaflet stated that "the Printers' Council, realizing the opportunity afforded, has designed and printed this program and booklet in the short time allotted, to show the grade of printing Pittsburgh printers can do, and as a souvenir for this occasion."

A striking cover, a fine quality of paper, and the latest in type faces grace the booklet, which includes the program of the dinner and the reports of the 16 Councils of the Pittsburgh Chamber of Commerce. The Printers' Council has a membership of 74, according to the souvenir booklet, and is one of the most active in the Chamber.

Each member of the Pittsburgh Chamber of Commerce is urged to become a member of one of the several Councils, which have been established chiefly to assure important trade and professional groups the proper support of the Chamber of Commerce and to keep that organization accurately advised on the problems confronting those groups as parts of the community.

State Chamber Advocates Unification of All New York City Transit Facilities under Municipal Ownership

THE Chamber of Commerce of the State of New York unanimously adopted on February 7 a report of its Committee on Public Service in the Metropolitan District, recommending that plans for unification of transit facilities in New York City, a matter that has been under discussion for some time with particular reference to rapid transit, be made to include surface cars and busses as well as subways and elevated lines. The report took occasion to repeat the position previously taken by the Chamber, that there be complete municipal ownership of all transit lines, it being stated that the city was already committed to this principle through the ownership in the subways. The Chamber's opposition to municipal operation was, however, insisted upon; and the principle that bus lines should be considered as auxiliary to, rather than competitive with, the subways, elevateds, and the main arteries of street railway traffic, was reiterated.

Convention Entertainment Likely to Be Overdone

A BELIEF that convention entertainment features are overdone and consequently detract from the serious business of such gatherings, as well as deprive merchants of the proper monetary returns, was broached in a recent bulletin of the New Orleans Association of Commerce.

The Southern chamber does not advocate the elimination of entertainment numbers, but rather holds that this portion of the program, in most instances, might well be condensed. In summarizing its comments on the problem, the New Orleans organization says:

The Convention and Tourist Bureau feels that a luncheon and harbor trip in honor of the delegates to conventions here would be sufficient courtesy to them in the way of entertainment, and the Bureau therefore plans to put that theory into practice.

The policy to be followed in the Bureau's convention activities for 1929 also opposes the distribution of free tickets or reductions in rates for local amusements and other entertainment functions. It is the opinion of the Association that delegates are perfectly willing to pay standard rates for entertainment and living accommodations, and are desirous only that increased charges be prevented.

Who?—Why the Chamber of Commerce, of Course

A SERIES of pithy questions was utilized recently by the Duluth Chamber of Commerce in its publication, "The Duluthian," to direct attention to the important work which it is doing for that city.

The queries, to which the obvious answer is "the Duluth Chamber of Commerce," were headed "If You Should Ask—" and included the following:

WHO is taking a leading part in the acquisition of an airport for Duluth?

WHO gives intelligent and effective leadership in civic affairs?

WHO is taking a leading part in the fight for a waterway to the sea?

WHO is going after the garbage problem to improve collection and disposal?

WHO sends out thousands of pieces of literature advertising Duluth each year?

WHO is organized and ready to fight for Duluth in railroad traffic matters?

WHO is cooperating with the farmer and agricultural schools in crop development, improving stocks and getting good roads?

WHO is working to obtain a beautiful and well built Federal Building for Duluth?

WHO assists in bringing and entertaining conventions in Duluth?

WHO carrys on a definite and well outlined program of safety work in the city?

WHO fosters a spirit of "goodwill" in Duluths trade territory?

WHO has drawn an up-to-date Fire Prevention Ordinance creating a Fire Prevention Bureau in the city of Duluth Fire Department?

WHO took a leading part in the effort to pave Michigan Street and who is trying to secure a better lighting system for our streets?

WHO helped to increase Duluth's hotel facilities?

WHO is taking an active part in the move to provide a Municipal Auditorium for Duluth?

GAMEWELL

1929 MODEL

PEERLESS TRANSMITTER

ANOTHER member of our 1929 line of models used for sending out box and telephone alarms to engine houses on automatic, semi-automatic, and manual systems. Among its features are: positive non-interfering and succession movement that looks in at every round, complying with N.F.P.A. recommendations—dial type of number set-up—locked dials to prevent interference following number set-up—special code signals can be sent preceding box numbers—greater speed in number set-up—all number dials restored by one operation—panel sloped at convenient angle—dead front panel protects operator—highly insulated throughout—handles 1 to 4 rounds inclusive—capacity of 24 complete rounds at one winding.

Descriptive Bulletin Sent Upon Request

THE GAMEWELL COMPANY

Newton Upper Falls, Mass.

"A BOX A BLOCK"

Items and Abstracts *for* DEPARTMENTS *of* PUBLIC SAFETY

Chief Justice Taft Urges Larger and Better-Organized Police Forces

THE part municipalities should play in the growing campaign to reduce crime throughout the country, was stressed by Chief Justice William Howard Taft of the United States Supreme Court recently in an interview reported by Basil Manly in the *New York Evening World* and other newspapers.

Rather than submit to the increased criminal activity or attempt to cope with it through our present police forces and court procedure, Mr. Taft believes cities and states must intensify and perfect the entire machinery of justice.

Referring to organized crime, the Chief Justice is quoted as saying: "There is a problem which unquestionably menaces our civilization. Our entire machinery of justice must be geared up to cope with it. Our police forces, our prosecuting organizations and our court system must all be improved until we are able to subdue these criminal organizations.

"First of all, we must detect and capture criminals. This means a larger and better-organized police force in every state and city. It will cost some money, but in proportion to the menace which confronts us it will be cheap at almost any price. Every state should have an efficient constabulary. It should be organized not only to patrol the rural districts and the state highways but also to reinforce the police forces of towns and cities whenever conditions may make it necessary.

"If we can perfect our police systems and our court procedure, I have no doubt that within a reasonable time, we can bring under control even the most aggressive gangs which are now preying upon our cities and states."

Steel Vests and Machine Guns, Motorcycles and New Uniforms for Toledo Police

TEN machine guns and ten steel vests are now being used by members of the Toledo, Ohio, Police Department in their campaign against crime.

Reviewing the major activities of that department during 1928, the *Toledo City Journal* remarks that "the training of the men to use these deadly instruments has no doubt had a very potent effect upon the crooks who have made Toledo their headquarters for operation."

To overtake speeders and to aid in the general patrolling of the city, ten new high-speed motorcycles are reported to be proving very effective. The number of persons arrested for speeding increased from 289 during the first 11 months of 1927 to 1,974 during the same period of 1928. Another improvement, the *City Journal* says, is new-style police uniforms, which have given the entire force a more distinctive appearance.

Several of the policemen who in former years filled clerical positions in the police division have been placed in active service, increasing the active man-power appreciably. By employing 20 men at $3 per day to act as traffic police in the vicinity of schools, regular policemen have been released for more active duty. Additional officers have been made available for other work through the installation of 36 new automatic traffic lights in 1928.

To relieve the congestion in the criminal branch of the municipal court and to separate cases involving traffic misdemeanors from more serious criminal cases, a traffic court was established last year. It is now unnecessary for the traffic violators to wait in court until the criminal cases have been heard.

Fire Prevention Bureau Is Effective in Detroit

EXCLUSIVE of one huge fire in 1927, the annual fire loss in Detroit has been practically the same for four years, despite the fact that 28,000 new buildings were erected during the past year alone, according to the National Fire Protection Association.

The 1928 report of the Detroit Fire Prevention Bureau reveals that the loss from incendiary fires last year was the lowest in five years and that 10 convictions were secured. Inspections for the year totaled 65,099 and 35,925 hazardous conditions were remedied. The 1928 fire loss in Detroit was $3,682,964; in 1927, $5,786,369; in 1926, $3,985,761; and in 1925, $3,985,761.

Training Police and Firemen in New York State

AS a direct result of the success of the police training schools in New York State this winter, the State Conference of Mayors is now contemplating a similar system of instruction for firemen.

Data collected by the New York State Bureau of Municipal Information disclose that only 14 out of 36 cities reporting, and but 5 out of 23 villages, now operate training schools for their firemen. In all the other communities special drills at stated periods, instruction by chiefs and captains, instruction of volunteers by regular men, etc., constitute the only training given the firemen.

Nine of the ten zone headquarters for the police schools reported a total attendance of 2,620 for the first week. The Rochester school led with 723 men attending the classes; Mineola was second with 551; Buffalo drew 469 from its district; and Binghamton, 216. Attendance at the schools in the other zones included White Plains, 170; Utica, 154; Troy, 138; Kingston, 114; and Schenectady, 85. The Syracuse school had not started to function when these figures were compiled. There were 37 zone cities, 35 first class zone villages, and 41 other municipalities represented at the nine schools.

Additional information gathered discloses that the State Police School at Troy has 12 policemen from 2 cities and 1 first class village among its students. In percentage figures, 85 per cent of the first class villages of the state have policemen under training in a zone school and 75 per cent of the cities. Including all schools, there are 117 municipalities in New York State which have policemen under training at the New York City Police School, or the State Police School, or a zone school. There are 8 cities and 3 first class villages in the Syracuse zone, the school for which has not yet started. The zone schools also are training men of the Westchester County Parkway staff, the Sheriff's office of Rensselaer County, the Nassau County Police, the Great Neck, L. I., Estates, the Long Island Railroad, and the New York Central Railroad.

These zones schools are being conducted under the auspices of the New York State Conference of Mayors. Cornelius F. Cahalane, police consultant for the Holland Tunnel Commission, is the Conference's consultant.

Town and City Join to Solve Rural Fire Problem in Wisconsin

AN agreement has been reached providing for the purchase of rural fire-fighting equipment by the town of Fond du Lac, and its maintenance by the city of Fond du Lac, Wis.

The town is to purchase a fire-truck fire-hose, ladder, and chemical equipment. The city will maintain and provide all necessary repairs, and re-charge the chemical tanks. It agrees to respond to all alarms in the township and any adjoining territory to be determined later. Two members of the city department will accompany the truck on all runs, and in the event that the equipment is out of service for repairs, the city agrees to provide one of its own trucks to respond to alarms.

According to *The Municipality*, the publication of the Wisconsin State League of Municipalities, the city does not agree to furnish complete fire protection for the rural districts, but merely to provide a service supplementary to the regular volunteer service. The city is also relieved of all liability by the terms of the agreement, which is effective at once and continues for the life of the equipment. The Town Board has evolved a plan for placing the apparatus at the disposal of property owners residing outside the town of Fond du Lac and within a reasonable distance of the town lines. The minimum fee for such service has been placed at $25 for residences, while other property will be protected in accordance with the extent of the investment.

Fire, Police and Traffic Officials

will find articles concerned with their interests on pages 85, 96, 98, 115, 116 and 150.

STOP

STOP BOULEVARD

HOSPITAL QUIET

Recommendation No. 79

Quoting from Page 30, Report of Committee of American Engineering Council on Street Traffic Signs, Signals and Markings, 1929.

"A flexible sign insert may be used as an alternative marker for words painted on surface of the roadway. Such a marker shall be made of rubber or similar flexible material that will stand upright under normal conditions, but will bend flat on the pavement when hit by the wheels of a vehicle, so that it will offer no resistance to the free passage of the vehicle nor damage it nor the marker. Such a marker shall not be larger than eight inches in height and thirty inches in length, and shall have yellow letters on a black background. The base of the marker shall be inserted in the pavement in such a way that it may be readily removed either for replacement or in winter to avoid its destruction by snowplows."

NO PARKING

SLOW

Note That this Recommendation Perfectly Describes

STANDARD Sure Stop MARKER

They are made of Flexible Rubber.
They are installed in the pavement or dirt road.
They stand 7 inches high and are 22 inches long.
The letters are bright yellow on black background.
They stand upright on the pavement in direct line of vision.
When vehicle passes over marker it bends flat to pavement offering no resistance and without injury to the vehicle or the marker.
When run over at any angle the marker flips right back into upright position; this flexibility makes it self-cleaning. They need no attention after once installed.
They may be readily removed for replacement, or, in winter to avoid destruction by snowplows.

Standard Flexible Rubber Traffic Markers Are Now Being Used by More Than a Thousand Cities

NO LEFT TURN

NO U TURN

Standard Traffic Marker Co.
1711 East Second Street
WICHITA, KANSAS

Standard Traffic Marker Co., Wichita, Kansas.
Send us full details of your FREE TRIAL OFFER.

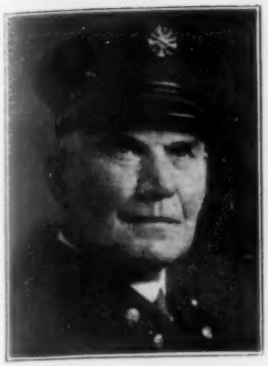
USE THIS COUPON FOR FREE TRIAL OFFER

Name .....

City .....State.....

SCHOOL SLOW

Why not remember to mention THE AMERICAN CITY?



GEORGE M. KELLOGG
Fire Chief, Sioux City, Iowa
(Appointed 1889)

FRANK A. BRADY
Police Chief, Davenport, Iowa
(Appointed 1928)

CHARLES MOHLIS
Police Chief, Waterloo, Iowa
(Appointed 1926)

L. F. BLANK
Fire Chief, Burlington, Iowa
(Appointed 1902)

CHARLES SLOAN
Fire Chief, Ottumwa, Iowa
(Appointed 1914)

WHO'S WHO IN PUBLIC SAFETY

A Series of Portraits of Fire and Police Chiefs, Which Have Appeared Monthly Since the January, 1928, Issue

H. J. CALLAHAN
Fire Chief, Ft. Dodge, Iowa
(Appointed 1925)

J. J. BROWN
Fire Chief, Muscatine, Iowa
(Appointed 1915)

C. F. BENDA
Police Chief, Iowa City, Iowa
(Appointed 1927)

DANIEL H. SHIRE
Fire Chief, Mason City, Iowa
(Appointed 1927)

E. M. FLATTERY
Police Chief, Ft. Dodge, Iowa
(Appointed 1918)

THOMAS Q. JENIKE
Police Chief, Norwood, Ohio
(Appointed 1926)

C. C. PIGMAN
Fire Chief, Marshalltown, Iowa
(Appointed 1919)

JOHN ANDERSON
Fire Chief, Keokuk, Iowa
(Appointed 1905)

CHARLES PHELPS
Police Chief, Jackson, Mich.
(Appointed 1924)

When Construction Blocks the Road—

Will the Red Lantern be reliable all night long?

THE NEW

EVEREADY PORTABLE FLASHER

THOUSANDS of new roads are being built all over the country. New crossings. New dangers. When autos come thundering out of the darkness—families coming home from town—salesmen driving hard late at night—when they approach your danger sign will there be a warning signal there, regardless of time or weather?

Lives will be saved this year by the new Eveready Portable Flasher. Its penetrating intermittent flashes show the warning red of danger 60 times a minute. The motorist driving home at night with his wife and children sees its gleam of red stabbing through the blackness, and stops. Detours around the danger.

Put an Eveready Portable Flasher on every bad highway corner, dangerous crossing, obstructed street or road, temporary excavation and wherever safety signals are needed. These flashers will take care of themselves for two months without human attention.

Eveready Portable Flashers have absolute, unwavering dependability. They cannot be blown out by the strongest gales. Yet these flashers can be serviced for only $10 a year. They require no daily inspections, and thus eliminate upkeep expense. Buy the new Eveready Portable Flasher from National Carbon Company's distributors.

NATIONAL CARBON COMPANY, INC.
New York, N. Y.

Branches

Atlanta Chicago Kansas City
Long Island City San Francisco

Union Carbide UCC *and Carbon Corporation*

EVEREADY
TRADE MARK
PORTABLE FLASHER
— dry battery operated

Specifications—Height 16 inches. Diameter of base 7 inches. Weight, including batteries, 16½ pounds. Requires four standard Eveready 6-inch Dry Cells connected in series to deliver 6 volts. Extra 6-volt lamp inside battery housing. Battery compartment constructed of seamless steel attractively finished in red. Top of flasher cadmium plated for weather protection. Heavy fresnel-type red glass lens. Padlock for battery compartment with an extra-long hasp so that the device can be chained. This flasher is of rugged construction throughout and entirely weather-proof.

CATALOGS WILL HELP YOU

THE AMERICAN CITY should always be mentioned when writing for this material which is furnished free.

Keep your files up to date by checking over these items each month and writing for those you need.

LOW-COST ROAD CONSTRUCTION

The American Tar Products Co. (P. L. Griffiths, Mgr., Tarmac Dept.), Union Trust Bldg., Pittsburgh, Pa., will be glad to tell you methods of using Tarmac by which highway officials who have large mileages and limited funds can give their taxpayers smooth year-round roads at low cost.

ELEVATED TANKS AND TOWERS

The illustrated booklet of the R. D. Cole Mfg. Co. (Bryan Blackburn, Engineer), Newnan, Ga., describes Cole elevated tanks and towers to meet any special requirements, as well as standpipes, boilers, flumes, etc., made by this company.

VOTING MACHINES

The Automatic Registering Machine Co., Inc. (Russell F. Griffen, Vice-Pres.), Jamestown, N. Y., has issued an illustrated booklet, A-4, describing the voting machines made by this company.

READY-MIXED CONCRETE BODIES

The new ready-mixed concrete body developed by C. O. Bartlett & Snow Co., Sam Gertz, 6200 Harvard Ave., Cleveland, Ohio, is described in Bulletin 62, which will be sent on request to road and street officials.

THE SILENT PATROL

The Indian Motocycle Co. (W. S. Bouton), Springfield, Mass., will gladly send its descriptive literature on the new Indian-4, which is silent in operation, has quick getaway, two independent braking systems working on front and rear wheels, low center of balance that allows turning corners at speed, and other features of advantage to police patrol work.

FLOODLIGHTING

This is the title of a new and very interesting 38-page booklet by O. F. Haas and K. M. Reid, which presents a comprehensive design procedure, together with suggestions on floodlighting effects, equipment and equipment location, and which may be secured on request from Kirk M. Reid, Engineering Dept., National Lamp Works of the General Electric Co., Nela Park, Cleveland, Ohio.

TANDEM ROLLERS

The Barber Asphalt Co. (W. F. Hartzell, Adv. Mgr.) 1600 Arch St., Philadelphia, Pa., will be pleased to send to interested highway officials, highway engineers and contractors copies of its 16-page Bulletin No. 1A, which describes Iroquois tandem rollers, giving a list of repair parts, and directions for operation and maintenance.

TAX APPRAISALS

The Lloyd-Thomas Co. (Wallace W. True, Asst. Vice-Pres.), 4411 Ravenswood Ave., Chicago, Ill., will be glad to send copies of its Booklet A-105, which describes the Lloyd-Thomas scientific tax equalization service, which furnishes provable property values, an accurate base for the tax levy and a basis for true equalization.

ROCK-CRUSHING EQUIPMENT

The Good Roads Machinery Co., Kennett Square, Pa., has issued a very complete 44-page catalog KCE completely describing its rock-crushing equipment, screens, conveyors, chutes and bins.

A NEW 5-UNIT FAIRWAY MOWER

A new gang mower composed of five 30-inch, 5-blade mowing units cutting a 142-inch swath and known as the New Fairway Quint, is described in an interesting new catalog of the Pennsylvania Lawn Mower Works (J. S. Bongright, Vice-Pres.), 1650 N. 23rd St., Philadelphia, Pa., which also describes this company's complete line of mowers for golf courses, parks and private estates.

AERIAL PLATFORM LADDERS

The Seagrave Corp. (Lester Stevenson, Sales Mgr.), Columbus, Ohio, has announced an aerial platform ladder mounted on a Ford truck chassis which is admirably adapted for such municipal work as servicing street lights, spraying trees, adjusting suspended traffic lights and making repairs to trolley wires on municipally owned street-railway systems. This ladder is completely described and illustrated in a very interesting folder, which may be secured on request.

A FIRE DEPARTMENT SALVAGE PUMP

Bulletin No. 288 F of the Byron Jackson Pump Co. (Chas. E. Mowry, Sales Engr.), Berkeley, Calif., describes this company's line of centrifugal fire pumps, including the salvage pump, which is built with small wheels and narrow treads to permit its being maneuvered through doors and into buildings to draw off the water poured onto a fire before it can collect and cause damage to goods stored in a basement.

CORROSION-RESISTING CAST IRON PIPE

A threaded pipe made of corrosion-resisting high-quality alloy iron in diameter from 1½ to 6 inches has been announced by the American Radiator Co. (M. L. Stiver, Adv. Mgr.), 40 W. 40th St., New York, under the name of Arco metal pipe. It is described in detail in Catalog Form No. 9012 of this company.

HOISTS AND DUMP BODIES

Information regarding the complete line of Wood hoists and all-steel dump bodies for every municipal service, may be secured on request from the Wood Hydraulic Hoist & Body Co. (Frank H. Dewey, Gen. Mgr.), 7924 Riopelle St., Detroit, Mich.

GARBAGE INCINERATION

The Nye Odorless Incinerator Corp. (R. S. Varborough, Sales Mgr.), Macon, Ga., will gladly send complete information regarding Nye garbage incinerators, which require no skilled labor, no fuel and no separation of the refuse, burning wet garbage rapidly and without obnoxious odors.

TRAFFIC SIRENS

Bulletin 660 of the Sterling Siren Fire Alarm Co., Inc. (F. C. Buckley), 53 Allen St., Rochester, N. Y., illustrates Sterling traffic sirens, which are posted at important intersections and operated from a central source, sounding a note of warning before fire apparatus approaches, as well as other Sterling sirens for municipal use.

MUNICIPAL PLANTING

The Storrs & Harrison Co. (W. C. Harrison, Pres.), Box K, Painesville, Ohio, will be pleased to quote prices on its general nursery stock, including trees, shrubs, roses and hardy perennials.

DEEP-WELL PUMPS

Catalogs on Pomona double-stroke deep-well power pumps which will serve for every deep-well pumping need, may be secured on request from the United Iron Works, Inc. (A. C. Dailey, Adv. Mgr.), Springfield, Mo.

A GRADER WITH NEW LIFTING MECHANISM

The W. A. Riddell Co. (W. A. Riddell, Pres.), Dept. F, Bucyrus, Ohio, will be glad to send to those interested a complete description of its new rear-control, one-man Warco grader, which is equipped with a new screw lift mechanism for raising and lowering the blade.

MECHANICAL DISTRIBUTORS FOR ROAD WORK

A recent 16-page booklet describing the Big Sandy and Handy Sandy mechanical distributors for road surfacing, which are made in a number of models to suit various needs, may be secured by any one interested, from Highway Service, Inc. (Milton Burghardt, Pres.), New Bedford, Mass.

BETTER CARE FOR METERS

The Ford Meter Box Co. (T. W. McNames, Sec.-Treas.), Wabash, Ind., has recently issued a folder describing its complete line of meter setting and testing equipment of all kinds, which will be of particular interest to water-works officials.

SCHOOL FIRE-ALARMS

A manually operated fire-alarm system which is shipped complete with erection blueprint ready for installation, has been developed by the Thomas-Smith Co. (V. R. Levinger, Gen. Mgr.), Canton, Ohio, is described in its literature, which may be secured on request.

ONE-WAY TRUCK SNOW-PLOWS

The Batavia Steel Plate Construction Co. (Lester T. Ross, Sales Mgr.), Batavia, N. Y., has developed a moldboard snow-plow which can be readily attached to all types of modern motor trucks. This plow is described in a 16-page, well-illustrated catalog issued by this company.

FRICTIONLESS WATER METERS

Complete data regarding Hersey water meters which are of the direct flow type and in which mechanical and hydraulic friction is reduced to a minimum, may be secured from the Hersey Mfg. Co. (Walter Hersey, Pres.), E. and Second Sts., South Boston, Mass.

AIRPORT COLOR LIGHTING

Bulletin No. 76 of the Reynolds Electric Co. (E. F. Stoker, Adv. Mgr.), 2800 W. Congress St., Chicago, Ill., describes Reco color hoods with holder for border lights on the airport or for signal lights of all descriptions, made in seven colors and in ruby glass.

TANKS AND STANDPIPES

Engineering advice on all kinds of riveted steel tanks, white-way lamp-posts, meter-boxes, park benches, sewer castings, anti-rattle manhole covers and rings, boilers and engines, may be secured without obligation from J. S. Schofield's Son Co. (J. Newton Barnes, Vice-Pres.), Macon, Ga.

CONTROLLING MOTOR TRUCKS

The Service Recorder Co. (H. R. Coot, Pres.), Hanna Bldg., Cleveland, Ohio, will gladly complete information regarding the Servis Recorder for trucks, which has been successfully used in cities and counties in the United States.

FIRE AND POLICE ALARM CABLE

The engineers of the Simplex Wire and Cable Co. (Arthur F. Lewis, Adv. Mgr.), 201 Devonshire St., Boston, Mass., are always ready to cooperate with city officials and others who desire information about properly designed, Fibrex protected signal cables for police and fire alarm service.

LARGE SHRUBS

W. & T. Smith Co. (Theo. M. Smith, Pres.), Geneva, N. Y., will gladly send complete information and prices regarding its complete line of large shrubs at special prices for city park and ornamental planting.

LIQUID CHLORINE

This is the title of a very interesting 40-page booklet which describes liquid chlorine, its properties, equipment, shipping and storing, uses of chlorine and its safe handling, as well as emergency measures. This booklet is issued by the Pennsylvania Salt Mfg. Co. (N. E. Bartlett, Vice-Pres.), Widener Bldg., Philadelphia, Pa., from which copies may be secured on request.

ORNAMENTAL TREES

A new price list of ornamental trees, flowering shrubs and evergreens for street and park planting has been issued by Wyman's Framingham Nurseries (R. M. Wyman, Mgr.), Framingham, Mass., and will be sent on request to interested city officials.

FIRE WILL NOT WAIT

Over 1400 departments kill small fires this way

Over fourteen hundred departments have installed the FOAMITE FD Extinguisher as standard equipment on fire apparatus. More and more, Fire Chiefs are ordering these FOAMITE Extinguishers for use on small fires.

The "FD" discharges about 20 gallons of fire-killing *Firefoam*, smothering fire under an air-tight blanket. *Firefoam* is just as effective on gasoline, oil, or any other blazing liquid, as it is on ordinary burning material. It puts the fire out and *keeps* it out.

The "FD" cuts down damage that usually results when water or liquid chemicals are used on small fires. *Firefoam* confines the loss to the fire loss itself. It puts out fire with the least possible damage to surrounding materials.

"Modern Fire Fighting Methods" is a booklet that describes all units of FOAMITE equipment that are especially designed for Fire Department use. Write for it. American-La France and Foamite Corporation, Engineers and Manufacturers, Dept C14, Elmira, N.Y.

AMERICAN-LA FRANCE AND FOAMITE PROTECTION

A Complete Engineering Service

For Extinguishing Fires

STREET BROOMS

Samples of Lay street brooms or a folder completely describing them, may be secured without obligation from the Jos. Lay Co. (H. J. Lay, Pres.), 1900 Wayne Ave., Portland, Ind.

WATER-TIGHT SEWER JOINTS

The Ric-wiL Co. (J. A. Willett, Adv. Mgr.), Cleveland, Ohio, has issued a folder describing Ric-wiL sewer joint compound, which is made of selected, refined asphalt with an acid-resisting filler for making permanent, waterproof and root-tight sewer pipe joints.

NEW SEWER DRAG SYSTEM

The Turbine Sewer Machine Co. (F. W. Fuchs, Sec.), 5210 State St., Milwaukee, Wis., has recently announced a new sewer drag system designed for use in cities without water pressure or without sufficient funds to purchase the more expensive Turbine sewer-cleaning machine.

TREES—SHRUBS—PERENNIALS

The catalog which will be sent on request by the Naperville Nurseries (F. W. Van Oven, Pres.), Naperville, DuPage County, Ill., describes this company's complete line of ornamental trees, shrubs, vines, evergreens and perennials for parks, playground, cemeteries, street improvements and forestry projects.

CLEANING WATER-MAINS

Literature regarding The National Method of cleaning water-mains without injury to the pipe lining, restoring mains to their former capacities, may be secured from the National Water Main Cleaning Co. (Burt B. Hodgman, Chief Engr.), Hudson Terminal Bldg., New York.

FULL-CRAWLER TRENCHERS

The Parsons Co. (N. D. Wind, Vice-Pres.), Newton, Iowa, will be pleased to send complete specifications regarding the Parsons 31, which is the biggest trench machine ever mounted on full-crawlers, and which can dig at either side or in the center.

WELL-CONSTRUCTED METERS

Complete data regarding the Arctic and Tropic water meters may be secured from the Pittsburgh Equitable Meter Co. (J. E. Brown, Dir. of Sales), 400 Lexington Ave., Homewood, Pittsburgh, Pa.

A PLANTING GUIDE

Pontiac Nurseries (B. J. Monahan, Adv. Mgr.), Romeo, Mich., will be pleased to mail you a copy of its new Planting Guide and a list of its special prices to park and cemetery superintendents and other officials for civic planting of trees, shrubs and evergreens.

CALKING CAST IRON PIPE

The Leadite Co. (George McKay, Jr., Pres.), Land Title Bldg., Philadelphia, Pa., will be pleased to send complete information regarding Leadite self-calking jointing material for cast iron pipe.

DEPENDABLE FIRE-HYDRANTS

A booklet describing Ludlow fire-hydrants, which are in use in over 3,000 cities in the United States, will gladly be sent to interested city officials by the Ludlow Valve Mfg. Co. (James H. Caldwell, Pres.), Troy, N. Y.

SAND-MOLDED CAST IRON PIPE

The McWane Cast Iron Pipe Co., Birmingham, Ala., will be pleased to send complete data regarding McWane cast iron pipe, which is sand-molded inside and outside and in making which the whole pipe is poured simultaneously.

LAWN-MOWER SHARPENERS

A catalog and list of users of the Peerless lawn-mower sharpener, made by the Fate-Root-Heath Co. (J. A. Root, Pres.), 908 Bell St., Plymouth, Ohio, will be sent on request.

SERVICE BOXES

The H. W. Clark Co. (Donald M. Clark, Sales Mgr.), Mattoon, Ill., manufacturers of water-works necessities, has issued a folder describing Clark service boxes with rust-proof, quick-acting plug, and Clark repair lids for service boxes.

MELTING FURNACES

Sheet No. 102 of the Hauck Mfg. Co. (F. J. Schwenck, Sales Mgr.), 126 Tenth St., Brooklyn, N. Y., illustrates and describes Hauck melting furnaces, both portable and stationary, with the new slide-rail heat control.

TREE SURGERY

The Davey Tree Expert Co. (Hugo E. Birkner, Ass't. Gen. Mgr.), 290 City Bank Bldg., Kent, Ohio, will be pleased to receive inquiries from park and street officials interested in the preservation of the city's trees through a systematic method of treating them to save them.

CAST IRON PIPE

Mono-Cast cast iron pipe, which is permanent and economical for water-works installations, is manufactured by the American Cast Iron Pipe Co. (Cecil A. Carlisle, Pub. Mgr.), P.O. Box 151, Birmingham, Ala., from which complete information and prices may be secured.

MOTOR FIRE APPARATUS

Literature describing any type of motor fire apparatus or fire department supplies will be sent on request by the American LaFrance and Foamite Corp. (Norman F. Kimball, Mgr. of Adv.), Dept. C-13, Elmira, N. Y.

PLAYGROUND EQUIPMENT

The 1929 Catalog describing the complete line of American slides, merry-go-rounds and playground devices and outfits of all kinds, may be secured from the American Playground Device Co. (J. E. Wilkins (Sec. and Treas.), Anderson, Ind.

PIPE FOR AIRPORT DRAINAGE

Complete information regarding Armco perforated flexible pipe, which cannot break from impact and provides continuous drainage for airport landing fields, may be secured from the Armco Culvert Mfrs. Assn. (Anton S. Rosing, Pub. Mgr.), Middletown, Ohio.

EASILY LAID PIPE

The Central Foundry Co. (Henry Hoeltge, Adv. Mgr.), 420 Lexington Ave., New York, will be pleased to send complete information and prices on Universal cast iron pipe, which requires wrenches as the only tools for laying to make joints that are tight, flexible and dependable.

TAR KETTLES AND HEATERS

Illustrated catalogs describing the complete line of Chausse oil-burning surface heaters, fire wagons, tar kettles, concrete mixer heaters, kerosene torches and portable asphalt plants may be secured from the White Mfg. Co. (W. McK. White, Pres.), Elkhart, Ind.

MOTOR MOWERS AND ROLLERS

Coldwell power mowers and rollers for any lawn-mowing or rolling problem at the price you want to pay, are described in literature which may be secured from the Coldwell Lawn Mower Co. (R. W. Speiser, Sales Mgr.), Newburgh, N. Y.

WATER SERVICES THAT SERVE

This is the title of a brochure just issued by the Copper and Brass Research Assn. (William A. Willis, Mgr.), 25 Broadway, New York, which should be in the hands of those contemplating the installation of service pipe.

ELECTRIC TRAFFIC SIGNALS

Traffic Signal Catalog 224 of the Crouse-Hinds Co. (F. W. Clary, Mgr., Pub. Dept.), Syracuse, N. Y., will be sent on request to street and traffic officials interested in the electric traffic signals manufactured by this company.

WATER WORKS PUMPS

Catalog B-64 of the DeLaval Steam Turbine Co. (H. D. Watson, Sales Mgr.), describes DeLaval geared turbine-driven centrifugal pumps for water-works plants, which handle water at the lowest total cost, including fuel, attendance and fixed charges on apparatus, foundations and buildings.

WATER AND GAS PIPE

The Donaldson Iron Co. (J. G. Eberlein, Pres.), Emaus, Lehigh Co., Pa., manufacturers of cast iron pipe for water and gas services, as well as special castings and flange work, will gladly send information on its products without obligation.

HOW TO MAINTAIN ROADS

This is the title of a free book issued by the Dow Chemical Co. (Donald Williams, Asst. Sales Mgr.), 361 Jefferson St., Midland, Mich., which gives complete information on Dowflake, calcium chloride, which, applied to the surface of a gravel road, absorbs moisture from the air, making the road surface smooth, firm, resilient and dust-free.

SLIPPERY PAVEMENTS

Full information and prices regarding the Goroco sand spreaders, which can be quickly attached to trucks loaded with sand and cinders and dispatched to various points to eliminate the danger of slippery pavements, may be secured from the Goroco Mechanical Spreader Co. (R. E. Eggleston, Pres.), Upper Darby P. O., Philadelphia, Pa.

ALL-STEEL DUMP BODIES

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TRUCKS FOR MUNICIPAL SERVICE

Information and prices regarding the complete line of General Motors trucks for every municipal service, as well as the new work test offer, may be secured by interested city officials from the General Motors Truck Co. (John M. Howard, Adv. Mgr.), Pontiac, Mich.

STREET SIGNS

The Allen Foundry, Adams, Mass., will be pleased to send complete information and prices regarding its no parking and caution signs, which are made of cast iron with raised black letters on an orange ground or in any color combination desired.

WATER REFERENCE CHARTS

Water-works officials who have often wished for a quick reference chart for converting figures from one set of measurement terms to another in figuring some water-works problem, may secure on request a set of the quick reference charts devised by R. W. Sparling, 945 N. Main St., Los Angeles, Calif., giving water flow in different size pipes at equal volumes in gallons per minute, weight, power and volume water equivalents, and equal rates of water flow.

CONCRETE CONSTRUCTION MANUAL

The Portland Cement Assn. (C. R. Ege, Mgr., Pub. Bureau), 33 W. Grand Ave., Chicago, Ill., will be glad to send complete information regarding a new authoritative manual of reinforced concrete design by A. R. Lord, who has perfected methods of reinforced concrete design that have produced outstanding economies. The price of this "Handbook of Reinforced Concrete Building Design" is $1 for single copies and 50 cents per copy in lots of six or more to one address.

MUNICIPAL SUPPLIES

Complete information regarding the line of municipal supplies and accessories for cities, towns, villages and public utilities handled by the Public Works Equipment Co., Inc. (L. P. Anderson, Pres.), 1776 Broadway, New York, may be secured on request from this company.

WARNING AND DANGER SIGNALS

City officials interested in highway warning and danger signals, Lens-Lite reflecting units and cast aluminum street signs of the highest type, as well as fire, parking and traffic signs, truck and vehicle safety reflectors and illuminated warning beacons, should write for information regarding the Redflex line, manufactured by the Redflex Signal Co. (E. S. Martin, Mgr.), 2675-2695 Pittsburgh Ave., Cleveland, Ohio.

HYDRANTS AND VALVES

The Eddy Valve Co., Waterford, N. Y., will be pleased to send complete information and prices on Eddy valves, which have a number of distinctive features, as well as data on the well-known Eddy fire-hydrant.

LIQUID CHLORINE

Data regarding the sterilization of water and the disinfection of sewage through the use of liquid chlorine may be secured from the Electro Bleaching Gas Co. (S. W. Jacobs, Vice-Pres.), 9 E. 41st St., New York.

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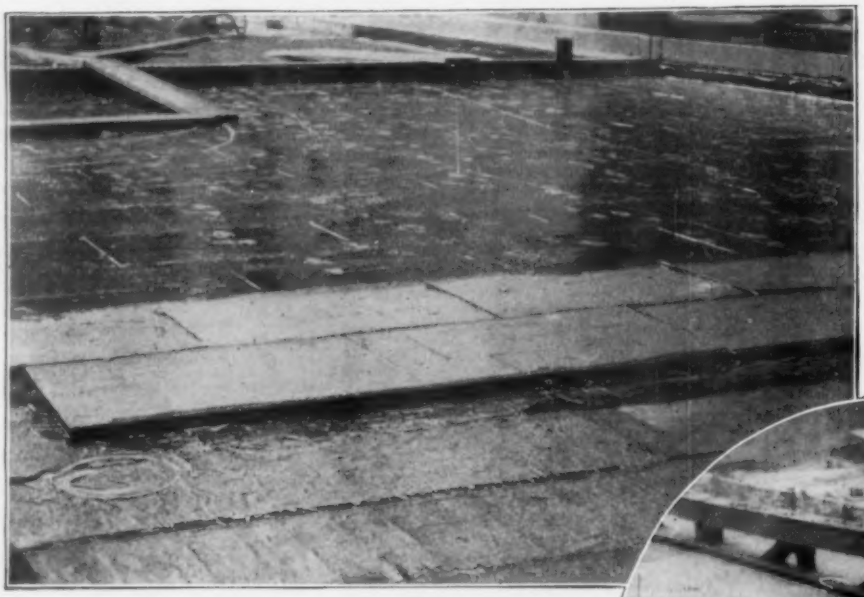
Literature telling why street cleaning the Elgin way is rapid, thorough, dependable and economical, as proved by over 430 cities, may be secured on request from the Elgin Corp (George C. Dodge, Pres.), 501 Fifth Ave., New York.

RUBBER-LINED FIRE-HOSE

The wax and para gum treated fabric, rubber-lined fire-hose of the Fabric Fire Hose Co. (W. T. Cole, Pres.), 9-15 Park Pl., New York, which has proved its worth in many cities, is described in literature which may be secured from this company.

Where Traffic Is Heavy—Use Servicised Products



THIS bridge, carrying an exceptionally heavy load of traffic, recently had its approaches paved with 14,000 square feet of *Servicised Protection Course*, while the bridge itself was surfaced with *Servicised Asphalt Planking* and *Servicised Sidewalk Material*—just another instance of careful selection of materials, to insure long and uninterrupted service.

IN this link bridge installation, *Servicised Protection Course* for waterproofing 1" thick, bedded in hot asphalt over waterproofed fabric, has given excellent satisfaction. The granite block pavement was placed immediately over the protection course.

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The three principal features of these products are, saving in construction and application; assurance of absolute protection from perforation, and the securing of a firmer base for the overlying covering.

Servicised Planking, because of its toughness, resistance to wear and excellent appearance, has received the unqualified approval of many engineers—satisfactory service being our best sales argument.

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MARCH, 1929
Vol. XL, No. 3

The American City

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50 Cents, $4 a Year

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5. *Fire and police departments properly trained and equipped*
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7. *Plenty of parks, parkways, playgrounds, and swimming pools*
8. *Administrative efficiency and citizenship cooperation in bringing these things to pass*

No Parking—a Year and More of It

How the Central Business District of Chicago Has Benefited from Prohibited Parking—Early Complaints of Apprehensive Minority Long Since Forgotten

By ROBERT H. NAU

Secretary, Street Traffic Committee, The Chicago Association of Commerce

A LITTLE more than a year ago —on January 10, 1928, to be exact—the zero hour had arrived for the beginning of a trial of prohibited parking in the central business district of the city of Chicago. Twice before in the annals of Chicago history, such an ordinance was about to be passed, but each time a test of its advantages was delayed—once in 1920 when the Mayor returned the ordinance to the City Council for further consideration, and in December, 1925, when the Street Traffic Committee of the Chicago Association of Commerce requested that action be postponed. On the latter occasion the ordinance was to be in effect for two weeks prior to Christmas. This request was based on the fact that the City Council had just invited the Chicago Association of Commerce to make a comprehensive study of the entire problem of traffic control. It was contended that it was not desirable at such an important season of the year to undertake such a short trial. The committee recognized the possible connection between parking and retail business and was unwilling that the experiment should be made until it had completed its exhaustive engineering investigation of conditions.

Results of Street Traffic Survey

The above-mentioned survey was made in 1926 and submitted to the City Council under the title of "Report and Recommendations of the Metropolitan Street Traffic Survey." The investigation was conducted by a committee of 78 members under the supervision of Miller McClintock, Director of the Erskine Bureau for Street Traffic Research. The report included the actual ordinances covering (1) the establishment of a traffic engineering division in the Department of Public Works, (2) the creation of the Greater Chicago Street Traffic Commission, and (3) a new set of traffic regulations.

One of the sections of this last ordinance prohibited parking in the central business district from 7:00 a. m. to 6:30 p.m. on all days except Sundays and legal holidays. Parking is permitted after 3:00 p. m. on Saturdays. The text of the present regulation differs materially from that proposed in the traffic survey, but in its effect and administration it is practically identical.

Little Business and Much Obstruction from Curb Parking

The facts discovered in the course of the survey indicated that curb parking contributed a negligible amount of business and created much greater obstruction than would be indicated by casual observation under the special traffic conditions existing in this area.

Among other studies was an investigation of customers' modes of transportation. This study revealed, in a one day count of 96,082 patrons, that only 1,505 or 1.57 per cent used space at the curb to park. The count took place in 33 different establishments, which included department, musical instrument, furniture, shoe and book stores, office buildings, banks and restaurants. Employees of these institutions made the check. The study was made in May, 1926.

In the same month the Loop district was found to be the concentration point for 846,750 persons daily between 7:00 a. m. and 7:00 p. m. Mass transportation agencies carried 80.8 per cent of these people, while the passenger automobile brought in 19.2 per cent.

It was also found that only 1,157 cars could be legally parked at the curbs in the Loop at any given instant, or 18,222 for the business day. The number actually finding space to stand in was considerably less, because the average parking time was found to be one hour and a half, although the then existing ordinance provided for only thirty minutes. Storage facilities in garages, Grant Park and other open-air places in the district accommodated 8,732 cars.

The streets of the district also are called upon to carry a large volume of through-cartage traffic from one railroad freight depot to another, and from them, in turn, to the business establishments within the area.

Curb parking caused a great amount of double parking and forced delivery vehicles to cruise until such time as a place could be found to unload. Generally, however, the driver found it necessary to park in the second line of traffic. Trucking interests were continually complaining because of drivers being arrested for this violation.

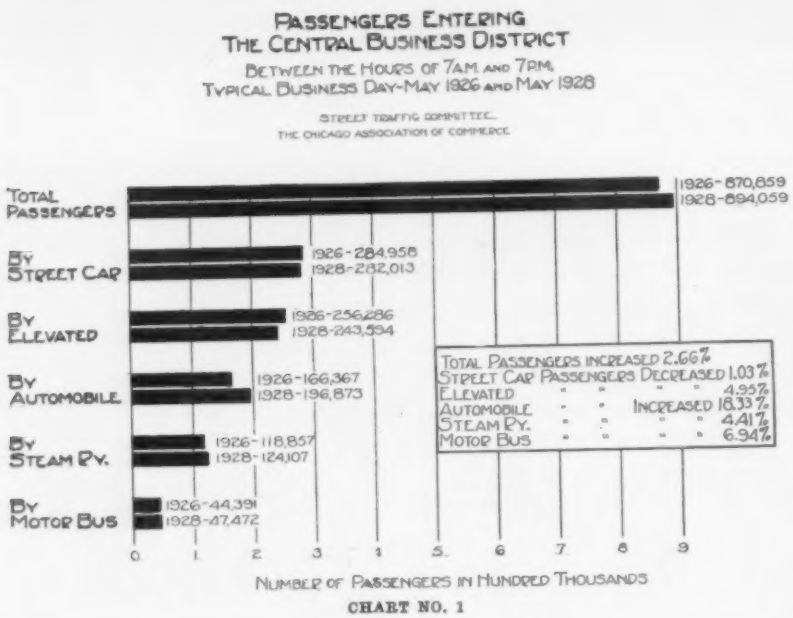


CHART NO. 1

This condition led the Association of Commerce Committee to include a recommendation in its survey for an ordinance providing for prohibition of parking in the central business district, which, by the way, is a larger area than the so-called Loop. It was believed that business operations would be materially benefited.

City Council Passes Ordinance

The ordinance was debated for a year, but in due time the City Council, with a feeling of heavy responsibility, passed it, and the Chicago merchants courageously submitted to a trial of the new regulation on January 10, 1928. Up to that time several cities had tried it, but panic-stricken merchants were successful in having the regulation discarded within a few days. The first two weeks the ordinance was in effect was an anxious period for the proponents of the regulation. Those opposed claimed financial losses, but were unable to substantiate their claims with definite facts. An injunction against its enforcement was sought by the owner of one of the buildings, who claimed that his tenants had threatened to move out if the ordinance continued in force. The injunction was denied by the court.

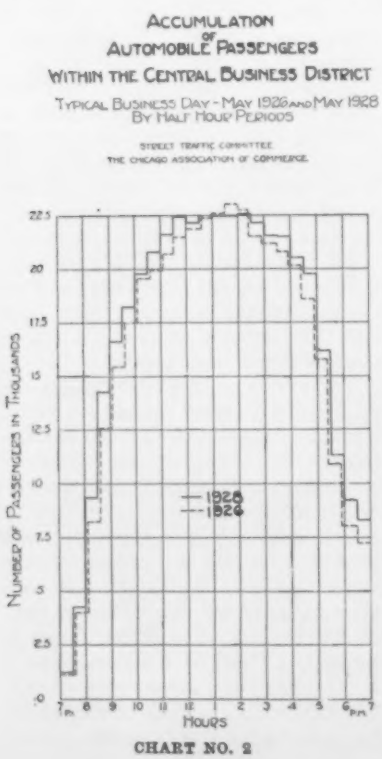


CHART NO. 2

During the first few days of protest, the Street Traffic Committee insisted that the utility of the ordinance be given a ninety-day trial, at the end of which time, if it were found too drastic, some action by the Committee would be started for its repeal. Preliminary figures were gathered as to the effects of the regulation, but when this period had passed over, there was no demand for the information. The Committee concluded, however, that in justice to business interests, it should repeat in May the studies it had made in the same month in 1926, and upon which the proposal for such regulation was based.

Steps Taken to Relieve Congestion

Before enumerating the benefits derived, it might be of interest to state that this ordinance was the third specific step in the program of clearing up congestion in this great center of business activity. In those days speed of traffic was about four or five miles per hour. In 1925 left-hand turns were eliminated. This improvement was followed early in 1926 by the installation of the now nationally famous system of automatic signals, which increased traffic speed up to eight or ten miles per hour. The no-parking ordinance now permits twelve or fourteen miles per hour. A fourth step will be the elimination of mid-block turns. This regulation was vetoed by the Mayor during the year, but it is bound to come. A fifth betterment will take place in the gradual reduction of the use of the horse-drawn vehicle.

Function of Transportation and Traffic Facilities

The purpose of transportation and traffic facilities serving the central district is to provide a maximum ease of access to the area for the population of the community. Transportation has no direct ability to affect the amount of money which individuals will spend, or, in general, to modify the economic factors of supply and demand. The business result, however, is by far the most important factor in any traffic regulation. To sacrifice business convenience to achieve a hypothetically ideal fluidity of traffic flow, would be the antithesis of sound control policy. Traffic flow is a means to business activity and not an end in itself.

Traffic and transportation cannot merchandise commodities or conduct business activity. They are merely agents for bringing the necessary parties together. The real business results of any change in transportation or traffic conditions are to be found in variations which may result in the total volume of persons or commodities carried to places where business is transacted.

Volume of Persons Entering the Central Business District

Attention is called, therefore, to the changes in the number of persons entering the central business district under present control conditions, as compared to those which previously existed, as shown by Chart No. 1.

It will be noted that the passenger automobile shows a very favorable position in competition with all other agencies. It is apparent that the motor car, as a carrier of passengers into the central district, is the only agency which could have been affected unfavorably by the application of the prohibited parking regulation. In view of the notable increases in automobile passenger traffic, the conclusion is fair that restricted parking has not destroyed the utility of this agency as a passenger and patron carrier.

Although more automobiles were coming into the area, it was claimed they were merely using the streets for pur-

poses of through travel and consequently were of little value as producers of retail business. In order to determine whether the ordinance had caused such a change in the number of people, a study was also made of the accumulation of automobile passengers within the area. The two curves showing this accumulation by half-hour periods, in both 1926 and 1928, are similar in general characteristics. The accumulation of automobile passengers in each half-hour in the May count of 1928 was greater than in 1926, with the exception of the time between 1:00 p. m. and 2:30 p. m. In this interval the accumulation was slightly less in 1928 than in 1926. (See Chart 2.)

Number of Street Traffic Units Entering the Central Business District

The general population movements into the central district by classes of transportation agencies having been discussed, attention is now called to changed conditions in the number of street traffic units entering the district. These results, likewise taken from the cordon counts of May, 1926 and 1928, are set forth in Chart No. 3.

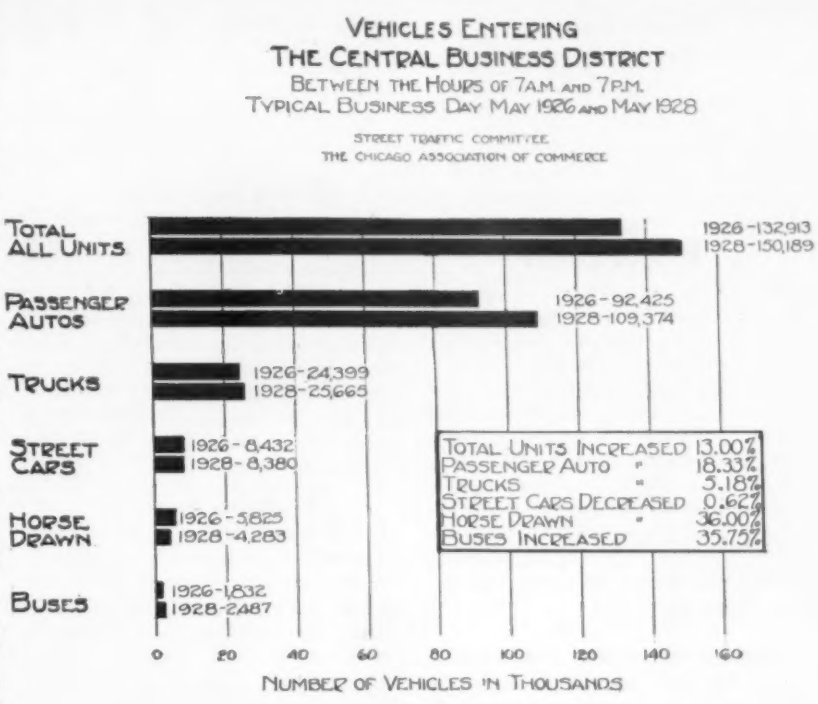


CHART NO. 3

The private passenger automobile shows not only a very favorable position in competition with all other passenger-carrying agencies, but is likewise shown as more than holding its position in relation to the number of street traffic units moving into the central district. The total increase of 1928 over 1926 is 16,949, or 18.33 per cent. The automobile registration for 1926 was 317,459, while for 1928 it was 360,985—an increase of 43,526 or 13.7 per cent. The increase in passenger automobiles was substantial as compared with the registration figures.

Experience of Surface Lines

As the surface cars bring the largest number of passengers into the district, any increase in their efficiency is of prime importance. An official of the Surface Lines reported in May that the ordinance had improved the running time to the extent of 15 to 25 per cent within the Loop. The elimination of double parking and maneuvering to get into or out of parking spaces made for more uniform speed for this agency of transportation.

OFF-STREET STORAGE FACILITIES RECENTLY PROVIDED IN CHICAGO'S CENTRAL BUSINESS DISTRICT

At left, North Loop Motoramp Garage, at Federal and Lake Streets; capacity, 600 stalls; height, 10 stories; opened to public October 15, 1928. At right, Glenn Holmes Garage, at Dearborn and Lake Streets; capacity, 800 stalls; height, 10 stories; so constructed that in the future additional stories may be added for office building purposes; cost of present building $1,200,000; opened to public January 15, 1929

Increased Traffic Flow

Shortly after the introduction of the regulation, the increased facility of flow, both of vehicles and of street cars, made it possible to shorten the cycles in the automatic signals and thus increase the speed of movement 15 to 55 per cent greater than under former conditions.

Accidents Reduced

It was not anticipated that the restriction of parking would have any material effect upon the safety situation in the central business district. Yet accidents, including fatal, non-fatal and property damages, as recorded by the Police Department, decreased from 1,100 in 1927 to 947 in 1928, or a falling-off of 13.9 per cent. Accidents for the city as a whole decreased from 17,784 in 1927 to 17,564 in 1928, or a decrease of 1¼ per cent. Fatalities, however, both in the central area and Chicago, show increases.

Enforcement of New Ordinance

The old thirty-minute parking ordinance required a considerably larger force of men to enforce than could possibly have been released to this work. Arrest slips in Chicago must be served on the violator personally, as any notice placed on the car would not have any standing in court. It was impossible for an officer to watch each and every vehicle on his post, and as a consequence cars were parked for long periods of time. When ready to leave, the owner of the machine would await an opportunity to slip away unnoticed by the officer. The present ordinance is much easier to enforce than the previous regulation. As a matter of fact, part of the traffic forces were removed from the area to the district immediately surrounding the territory, where attention was paid particularly to the matter of double parking. In 1927, arrest slips were given to 29,823 violators of the old ordinance, while during the past year, 21,550 arrest slips were issued for parking violation. This was a decrease of 8,273, or 27.7 per cent.

Fire and Street Cleaning Departments Benefited

The elimination of parking has been of tremendous value to the Fire Department. Cars are no longer found hampering the use of its apparatus at a fire. Space being available at the curb, vehicles can immediately move out of the path of the approaching fire apparatus. Then, too, the alleys are clear and therefore no automobiles are parked under fire-escapes. The running time from the station to the scene of the fire is less than formerly, because of the reduced interference of traffic.

The cleaning of the streets has been greatly facilitated. Where formerly it was difficult to broom the gutters, this is done now with ease. Street cleaners even find time to pay some attention to sidewalks. Snow was removed from the streets very rapidly this winter.

Off-Street Storage Facilities

When the May survey was made, it was found that the off-street storage facilities accommodated 14,571 cars, as against 8,732 in 1926. Since May a new 600-car garage has been completed, and two more are under construction, which will provide additional capacity for 1,380 more cars. Recently two more projects were announced which will increase the storage facilities in the district by 968 cars.

Results on Business

Has the regulation been harmful to retail business? Apparently the answer is in the negative, as some of the opposing interests have already opened additional places of business in the area. As this article is being written, an announcement in the daily newspapers states that a prominent high-glass restaurant is planning for an additional store in the near future. This interest was bitterly opposed to the present ordinance. Three candy companies added six stores to their string during the year. Two men's furnishing stores added three new locations, while a women's apparel company increased its shops from four to twelve in the same period. A drug-store chain has four more places of business in the district than it had a year ago. During the year, new office buildings pierced the sky, adding 1,500,000 square feet of rentable area. There are now under construction and contemplated, twenty new structures which will add about 3,500,000 square feet. At this point it will be of interest to know that the property owner who sought an injunction against the enforcement of the ordinance is now adding six stories to one of his buildings in the area. Certainly, these merchants and property owners do not question the future possibilities of the district as a shopping and business center under its present parking limitations.

The large department stores in the area, as well as the Chicago Association of Commerce, are continuing to watch for any pronounced ill effects. Unless they develop unexpectedly, it is believed that the great majority of the business houses will continue to support the regulation. Business would not be satisfied to return to the old chaotic conditions of by-gone years, as the attractiveness of the district has been increased because of the greater comfort and convenience for shoppers and workers alike.

The early complaints by a very small and apprehensive minority have long since been forgotten—yet at the time it seemed their voices would block progress toward a new and better condition in the central business district. A dissatisfied minority always makes an impression, and one wonders who is to take up the cause of the great multitude of individuals who either are satisfied with a change for the better or live in hope that something will be done to remedy an intolerable situation.

While it is believed that the experience during the past year has thoroughly justified the expectations of the Street Traffic Committee of the Association of Commerce, it should be pointed out that the local conditions are unusual and success of the regulation here does not lead to the conclusion that a similar rule will be equally successful in the central business areas of other cities where traffic and transportation conditions are dissimilar.

Results in Chicago have been due largely to the support of business agencies which have upheld the regulation on the basis of adequate data developed before and after its passage.

AUTHOR'S NOTE.—As mentioned in this article, the text of the no-parking ordinance was not the same as that recommended by the Street Traffic Committee of The Chicago Association of Commerce. In order to make it conform with the intention of the committee, an amended ordinance has been submitted to the City Council. On February 18, 1929, the changes were approved by the City Council's Committee on Traffic Regulation and Public Safety. It is hoped that the amended ordinance will be considered at the Council's meeting of February 27. The full text follows—the additional provisions are in italics:

PARKING PROHIBITED ON CERTAIN STREETS DURING CERTAIN HOURS

On and after February 28, 1929, no person, firm or corporation owning, controlling, driving or operating any passenger vehicle shall cause or permit such vehicle to stand *for a period of time longer than is necessary for the reasonably expeditious loading or unloading of passengers, provided such loading or unloading shall not consume more than three minutes; or to stand any commercial vehicle for a period of time longer than is necessary for the reasonably expeditious loading, unloading and delivery or pick-up of materials provided such loading, unloading and delivery or pick-up shall not consume more than thirty minutes* on any public street or alley in the city of Chicago within the district bounded on the north by the south line of Wacker Drive, on the east by the west line of Michigan Boulevard, on the south by the south line of Harrison Street, on the west by the east line of Market Street, nor upon the upper level of Michigan Avenue between the north line of Randolph Street and the south line of Wacker Drive, during the hours from 7:00 o'clock a.m. to *6:00* p.m. of any day except Sundays, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, and except on Saturdays when the restriction within the above designated area shall be in force from 7:30 o'clock a. m. to 3:00 o'clock p.m.; provided that this section shall not apply to any duly licensed taxicab when standing in any cab stand fixed by ordinance; provided, further, that it shall not apply to any ambulance nor to any emergency vehicle of the city of Chicago, Federal government, the County of Cook, or to the vehicle of any public utility while the operator of any such vehicle is engaged in the necessary performance of emergency duties; *and further provided that this section shall not apply to any vehicle brought to a stop to avoid collision, or standing in compliance with the orders of any police officer or the direction of any traffic control signal.* Any person, firm or corporation that shall violate or fail to comply with the provisions of this section shall be fined not less than $1.00 nor more than $25.00 for each offense.

Road Oiling Lifted Kalispell Above the Mud and Dust

By A. L. SAUNDERS
CITY ENGINEER, KALISPELL, MONT.

KALISPELL is a city of over 5,700 population and is the trade center of probably 30,000 people. It has a municipally owned water system, 90 per cent metered and 90 per cent cast iron water-main. It is a city of homes. The streets in the residential section are 30 feet wide between curb lines. On each side of the street is a cement walk 6 feet wide adjoining the property line, and between the walk and the curb line is a grass plot 12 feet in width set with shade trees, which are maintained by the city forces and the cost assessed to the property owners. These green parking strips and trees are strikingly noticeable and present a very neat appearance.

Unpaved Streets a Source of Trouble

For years the unpaved streets of the city were a source of expense and trouble throughout the year. In the late fall they became badly rutted, and freezing while in that condition went into the winter in very bad shape. As motor cars increased in numbers, broken wheels and springs likewise increased, and wherever possible it was a matter of good judgment to put one's car away until spring when the thoroughfares were in shape to use. The mercantile establishments, however, continued to operate delivery trucks, with the result that there was much badly mixed and damaged merchandise and consequent financial loss.

With the spring thaws, conditions grew worse, and cars were stalled in holes all over town. As soon as the mud was sufficiently dried up, graders and drags were called into action and in many cases the streets practically were rebuilt. Following the mud in a very short time, came the dust, and the housewife was called upon to constantly clean house. Flowers, shade trees and buildings were literally covered with dust and the front porch was deserted.

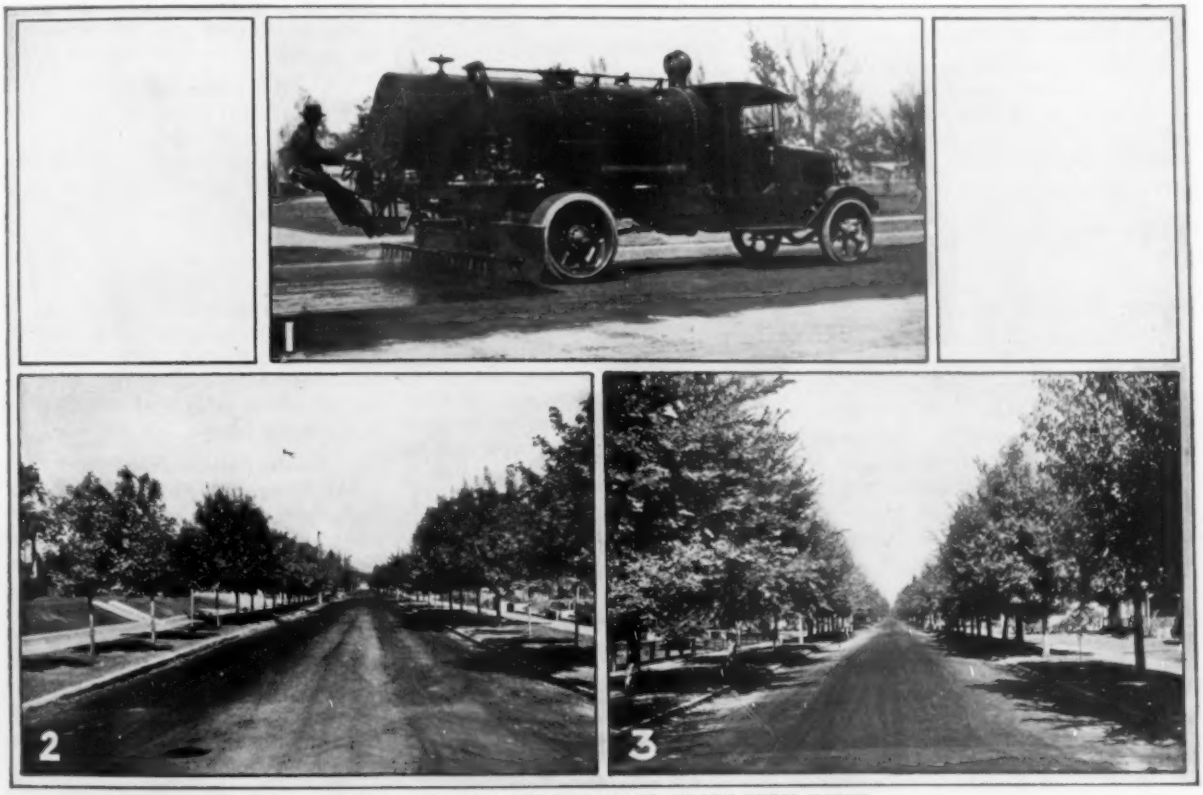
Street Sprinkling

Certain sections of the city paid for street sprinkling, but often between sprinklings dust would arise and the water gave only temporary relief. Small holes which developed in the surface of the street grew larger with continued sprinkling and constant traffic, and frequent grading and dragging were found necessary to keep the streets in good condition.

With the fall rains, the streets resumed their former rough and rutted condition, and the old story was repeated with the change of seasons and to the constant exasperation of the people and the annual waste of the taxpayers' money.

General Paving Plan Abandoned

With increased motor traffic, a general paving plan was suggested. Careful consideration of this, however, showed that the cost in most cases would be a hardship and confiscatory, due largely to the added expense for interest, discounts



OILED ROADS IN KALISPELL, MONT., PROVE THEIR VALUE

1. The city-owned oil distributor in operation. 2. Fifth Avenue East after improvement with oiled surface. 3. Second Avenue East is also free of dust and mud since the oiling program has been in force

and overhead in creating special improvement districts. Consequently the matter was laid aside.

Oiling by Subscription

With the abandonment of the paving idea, it was decided by a few individuals to try oiling. To start with, subscriptions were collected by residents on a certain street sufficient to defray the expense of oiling. The street was prepared and oiled with a fuel oil, and later on was given a second treatment. The dust disappeared and the contributors were pleased. The oil was distributed with an ordinary motor water sprinkler, and in both treatments a total of ½-gallon a square yard, costing 5¾ cents per gallon, was used. The result was immediately noticeable and the demand for oiling was general. Many subscriptions were circulated and almost over night the Street Department was swamped with demands for oil.

Oiling Paid by Assessment

All this happened in the early summer of 1926. Fortunately, there were two oil refineries in the city, from which the oil was available hot. The oiling work was quickly organized. Streets which were not in condition to receive oil were scarified and all oversize material removed. They were oiled following scarifying and again after blading, and then rolled with a steam roller. A total of 165,000 gallons of oil was used on the 16 miles of street. An inside lot owner paid $4.00 per 50-foot lot, and the corner lot owner having side frontage of 140 feet in addition paid $7.50 plus $4.00. This made the corner lot cost rather high, yet it was voluntary on the part of the lot owner as well as satisfactory to him, and he paid cash in advance.

The streets which were oiled went into the winter in good condition and in the spring required less than one-half the former amount of work to recondition them.

Asphaltic Base Oil Used

It became obvious that the demand for oil in 1927 would be general, and it was decided to use an asphaltic base oil. In the State Legislature the old sprinkling law was amended to include oil as well as water, and the method of assessment was changed to include the square-foot method rather than the front-foot method. The corner lot having the same area as the inside lot paid on the same basis. The city was divided into four oiling districts, comprising in all over 27 miles of streets. In addition to the concrete curbing in place, an additional 8 miles was constructed, replacing old wood curb and completing the cement curbing on eleven avenues and a number of the streets. With the completion of the curbing, the streets and avenues were trued up between curb lines and put into shape to be oiled.

Oiling Equipment

An 800-gallon Kinney oil and asphalt distributor mounted on a 5-ton G.M.C. truck was purchased. This machine was equipped to heat the oil and distribute it under any desired pressure and in any desired quantities. The city already owned other necessary equipment such as trucks, motor grader and scarifier and steam roller. A 15,000-gallon storage tank with trackage rights was purchased and equipped with steam coils to be furnished with steam when necessary from a traction engine owned by the city. During the 1927 season a total of 205,000 gallons of all grades of oil was used, 70,000 of which was asphaltic road oil, ranging from No. 4 to No. 6 road oil, or 40 to 60 per cent asphaltic residue. Strictly dirt streets were treated with fuel oil, while the cindered, graveled or crushed rock streets were given the asphaltic road oil.

Various experiments were made and both the surface mixing or processing method and the penetration method were used, depending upon the type of street. Most of the streets, however, were thoroughly scarified and then oiled. Following the first treatment of oil, they were thoroughly bladed and then oiled again, using in both cases fuel oil as a priming coat. They were then ironed out with a roller and treated with asphaltic road oil and covered with a light coat of sharp, clean sand to take up the surplus oil and prevent any oil from picking up. A wearing surface or crust soon developed which was impervious to water and dustless as well as smooth.

Cost

The oiling of 27½ miles of street cost $17,863, or an average of $650 per mile. The average cost of the two grades of oil was $0.0658 per gallon, and 0.485 gallons was used per square yard. The cost of distribution was $0.021 per gallon, which included the cost of sand, heating, unloading, depreciation, operating and supervision.

Effect on Civic Pride

With the disappearance of the dust menace and a decided improvement in the streets, a general clean-up and painting campaign suddenly came about, which gradually has developed into quite a building program.

Oiling in 1928

The oiled streets came through the winter and spring of 1927-1928 in remarkably good condition with a very small amount of work necessary to prepare them for the 1928 oiling. In the spring of 1928 there was an immediate demand for more cement curbing and walks, and a smart building program began early and continued throughout the year with a 300 per cent increase in building permits.

City Crusher Plant

To improve on the oiling by the use of chip rock for a cover in place of sand, the city purchased a crushing plant complete and installed it at the city gravel pit adjoining the washing plant of the sidewalk and curbing contractor. Oversize material was delivered to the motor-driven crusher by the curbing contractor at small cost, and the crushing plant was operated by two men. A total of 6,000 cubic yards of rock went through the crusher; 40 per cent was pea gravel and rock chip and was used to cover the 70-80 asphaltic road oil, while the coarser material was used on unsurfaced streets. The cost of sand during 1927 was high, owing to the royalty paid and the long haul, while in 1928 more yards of chip rock were used but at a lower cost and with much better results.

Quantities and Costs

In all, 173,000 gallons of oil was used in 1928, or 32,000 gallons less than in 1927. The average cost of oil in 1928 was $0.0726 as against $0.0658 per gallon for the previous year. Practically the same area in square yards was treated and the distribution charges remained about the same. In 1929, there will be a material reduction in the amount of oil needed, as many of the streets will require maintenance only, while the streets which were formerly treated for fuel oil will be given a more substantial treatment in future.

Results Entirely Satisfactory

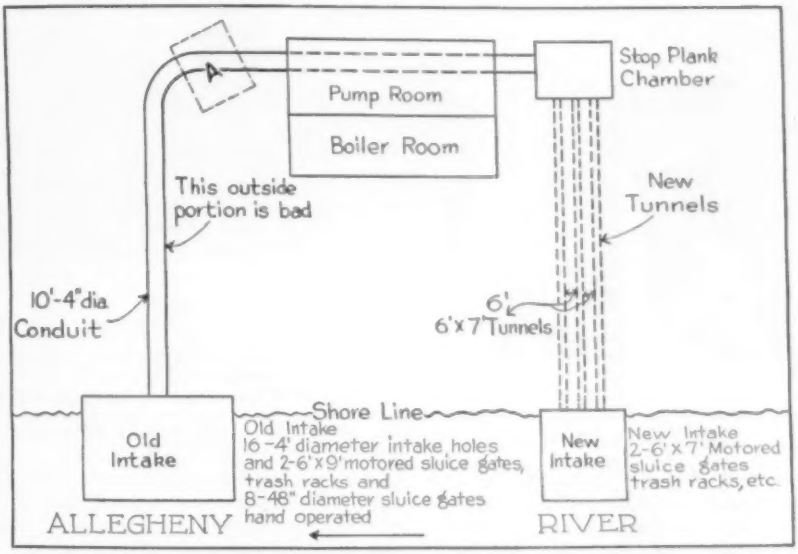
During the early stages of oiling there was considerable apprehension as to the result, as it was thought that the oil would pick up, track into the homes, ruin the finish of automobiles or tires, etc., but none of this occurred. Many of the streets now have an appearance of black-top pavement, and the question is often asked as to whether or not they are paved. The maintenance is small, inexpensive and easy to keep up. The oiler and three men can cover two miles per day, using the hand patching hose and covering with rock chips, often available from the curb line. While oiling is only a substitute for permanent paving, it is costing Kalispell approximately one-half the interest charge for permanent paving with the initial cost of the paving eliminated. Permanent paving costing from $2.00 to $2.50 per square yard at 6 per cent would figure 12 to 15 cents in interest, while the oiling costs from 6 to 7 cents per square yard. These facts have been demonstrated to the taxpayers through their tax notices, much to the taxpayers' satisfaction.

The New Ross Pump Station Intake of the Pittsburgh Water-Works

Structure Completed October 1, 1928, at a Cost of $391,000

THE old intake at the Ross Pump Station was a concrete structure 10 feet 4 inches in diameter, and the portion outside the station was 250 feet long. The original intake was poured in water in 1906. The base failed in one spot, and leaks were found in many places, as well as a longitudinal crack at the top throughout the exterior section. It was apparent that repairs could not be made and still maintain the intake in service.

Work was immediately begun on a new intake and suction trunk. The new intake has provisions for trash racks and is composed of twin tunnels of reinforced concrete 6 x 7 feet each, enclosed together in one envelope. Two 6 x 7-foot motor-operated sluice-gates at the river intake control the tunnels. Stop plank grooves are placed at the intake and also at the east end of the station. Stop planks of both steel and wood are provided at necessary points to isolate portions of the intake for cleaning and repair. The accompanying sketch shows the system as it is now operating. The elevation of the river is 27.5 feet, the ground 48.0 feet, and the elevation of the bottom invert of both the old and the new tunnel is 4.0 feet. The whole site was a fill of sand and gravel. The leaks in the old tunnel were carrying some of the supporting soil into the tunnel, and there was danger of the entire structure being undermined and badly damaged.



SCHEMATIC SKETCH OF OLD AND NEW INTAKES FOR THE ROSS PUMP STATION OF THE PITTSBURGH, PA., WATER-WORKS

Since the new tunnels were built, with the aid of a diver, the Bureau of Water has repaired one bad spot in the bottom of the old intake, but complete repairs would cost almost as much as the new structure. It is not expected to do any further work until a stop plank chamber can be built at the point A in the old intake.

There was considerable difficulty in dewatering the old intake at the time the suction pipe of the new 1,000,000-gallon turbine-driven centrifugal pump was installed, as the water ran into the tunnel in large quantities.

New Sewer Outfall and Pumping-Station for San Rafael, Calif.

Progressive Community Replaces 50-Year-Old Outfall with Reinforced Concrete Pipe

THE old outfall sewer of San Rafael, Calif., which was originally constructed about 30 years ago, is now being replaced with centrifugally spun reinforced concrete pipe. In the early part of 1928, sanitary conditions along the outfall having become intolerable, it was decided to build a new outfall. After considerable engineering study, the city decided that the solution of the difficulty was to construct an entirely new outfall line of concrete pipe and install a pumping-station to force the sewage to the proposed outlet in San Francisco Bay.

As a basis for estimates, it was assumed that the population of 8,000 in 1928 would increase to 13,500 in 1948. From an observed daily average dry-season sewage flow, it was found that a maximum of 1,375,000 gallons would have to be cared for. The maximum daily dry-season rate of flow is now assumed to be 1,600 gallons per minute, the minimum daily dry-season flow to be 600 gallons per minute and the maximum daily dry-season flow in 1948 is assumed to be 2,800 gallons per minute.

The observed wet-weather flow is approximately 5,000,000 gallons per day. A comparison of these flows showed that a capacity of 7,000,000 gallons per day would be ample.

System as Installed

The system now being installed includes a 21-inch centrifugally cast reinforced concrete pipe on a slope of 0.0015 from the toll-bridge at Tamalpais Avenue to Toll Road and Irwin Street. From this point to the pumping-station on the city property, a distance of about 1,000 feet, a 30-inch centrifugally cast reinforced concrete pipe is being installed with a slope of 0.0009. This pipe is being cast and supplied by the Bent Concrete Pipe Co., of Oakland.

The Pumping-Station

The pumping-station is being equipped with three pumps, one of 2,000 gallons per minute, one 3,500 gallons per minute, electrically driven, and one 5,000 gallons per minute gas engine driven pump, all automatically controlled. The 5,000-gallon-per-minute emergency pump discharges through an 18-inch centrifugally cast reinforced concrete pipe into San Rafael Creek, approximately 1,450 feet east of the pumping-station.

LAYING THE NEW OUTFALL SEWER AT SAN RAFAEL, CALIF.

Left, redwood cradle for 18-inch and 21-inch Hume concrete pressure pipe lines along San Rafael and San Quentin Road. Middle, lowering pipe into trench. Right, pipe installed in trench on redwood cradles

The 2,000- and 3,500-gallon-per-minute pumps are designed to operate individually and discharge into the 21-inch concrete pipe emptying into San Francisco Bay at a point about 5 feet north of the present outlet from the gravity sewer. The 18-inch discharge line is reinforced for a 100-foot head, and the 21-inch discharge line is reinforced in its upper third for a 90-foot head; middle third, 60-foot head; and lower third for a 30-foot head. The pump and motor capacities will allow a future extension of 1,000 feet for the outfall sewer without change. Storage is proposed, and a 40,000-gallon sump is to be installed.

Installation of Pipe

The pipe was transported by barges from the plant of the Bent Concrete Pipe Co. at Oakland to San Rafael, where it was loaded onto motor trucks and transported to the points where it was to be used. A redwood cradle was constructed and placed in the bottom of the trench for the 18-inch and 21-inch pipe. Heavy planks were placed across the trench and the pipe sections were rolled out onto them, then picked up by a chain hoist operating from heavy steel horses; the planks were then removed and the section lowered into place.

The contract for the construction of the outfall sewer system and the sewage pumping-plant is being carried out by W. J. Tobin, whose bid was $84,556. The work is being done under the supervision of H. K. Brainerd, City Manager and City Engineer.

Decide Now to Build Better Roads

Common Sense, Sane Thought and Complete Competent Engineering Control Are Essential

THE paving specifications used throughout the United States are, as a general rule, the latest standard specifications adopted by the Association of State Highway Officials, the American Society for Municipal Improvements, and the American Society for Testing Materials. There are, of course, in many instances, variations in these specifications, but in general they are not of a harmful nature. So the specifications in general use represent the best judgment of the highway engineers of this country, according to the report of the investigation of paving and general highway conditions made by the engineering commission to the National Paving Brick Manufacturers Association.

Construction

There are entirely too many localities where the specifications are not followed and, as a consequence, the construction is inferior and renders poor service. Many millions of dollars a year are lost in this way. A cure may be brought about by the employment of inspectors who know their business and will enforce the specifications.

"Window Dressing" Engineering Control

The difficulty is that in many localities the politicians limit the engineering control to what may be termed "window dressing." That is, the engineer controls everything but the supervision of construction. His control over construction is through unqualified inspectors who are forced upon him. This is a sad commentary to be obliged to make, but it is such a deplorable fact and the cause of such a tremendous loss of money that it is necessary to point out the seriousness of the situation.

Maintenance

Generally speaking, the maintenance of a state highway system is of a high standard and the pavements are kept in good condition. The average maintenance of county roads is only fair, and in the boroughs and townships it is generally poor. The maintenance in some of the cities is very good, while in many others it is poor.

Lack of adequate maintenance to provide not only smooth-riding pavements, but to conserve the investment in pavements, results in an enormous waste of public funds.

Three Outstanding Causes of Poor Pavements

The three outstanding causes of poor pavements are: lack of control over construction; inadequate foundation; and lack of proper provision to remedy poor subsoil conditions.

Lack of control over construction is the outstanding cause of poor pavements and one that will never be corrected until politics is divorced from all highway work. This is a problem for the highway user to solve. The other two are

up to the engineers.

The foundation situation is the easiest one to remedy and, as a matter of fact, the remedy is being applied in a great many localities by providing for foundations of adequate strength to carry the traffic. It is a distinctly poor policy to skimp on the foundation. So many instances have been observed where the paving brick used in the paving surfaces are in good condition and the foundation had failed, that it would seem as though these numerous existing examples of inadequate foundations would be sufficient evidence to eliminate forever any skimping on that part of the construction.

The third outstanding cause of poor pavements, the effects of subsoils on pavements, is a serious problem and one that has been for the last few years the subject of extensive research. There is less known about the proper treatment of subsoils than about any other highway problem. Sufficient information has been developed, however, from research investigations to warrant the statement that in the future there should be very many fewer poor pavements due to subsoil conditions. This will mean in many instances spending more money to correct poor subsoil conditions, but as foundation and pavement are dependent upon the subsoil, the necessary cost is certainly justified.

Subsoil conditions are a most important factor under all circumstances, but generally a far more important factor in the colder climates because of the effect of frost on the different kinds of subsoils. Foundations which are adequate in territories where there is little or no frost would not fill the bill in the colder climates.

Economics of Selection of Types of Construction

It is becoming generally recognized that the only consideration cost should be given in determining upon the selection of pavements is to supply a basic figure from which to determine the annual cost. The items that enter into the cost include: interest on the investment; the sinking-fund charges for the retirement of bond issues or to amortize the cost if paid from current funds; the annual cost for the upkeep of the road under different traffic conditions and the transportation costs; and the difference in the cost of operating motor vehicles on different types of road surfaces.

When the pavement is to be subjected to any appreciable amount of traffic comprising heavy loads, high first-cost standard pavements will show the least annual cost over a period of years.

The economic pavement in each instance is the one which will adequately serve the specific traffic, climatic, social and local conditions for the least annual cost over an extended period of years representing the expected ultimate life of the pavement.

There is no one type of pavement suited for all traffic, social and local conditions, but there are innumerable instances where each one of the accepted standard types is most suitable and will prove to be the economic pavement. It would be absurd to construct a pavement with a light-traffic surfacing on a heavy-traffic highway, and it would be equally absurd to construct a pavement with a heavy-traffic surfacing on a highway where the facts indicate that the future traffic will be very light.

It would also be false economy to construct a type of surfacing that is suited only for light traffic on all of the roads. The economic road surfacing or pavement may consist of any type of surfacing from a dirt road to a high-quality pavement of the vitrified paving brick or stone block type on a concrete foundation or an all-concrete pavement.

It is estimated that the total additional transportation costs for motor vehicles operated on dirt roads as compared with hard-surfaced roads, is 25 per cent. From this it may be readily seen that where there is any appreciable amount of traffic using a dirt road, the saving in the operating costs for these vehicles on the hard-surfaced roads as compared with dirt roads would justify the construction of a hard-surfaced road.

Assuming that the average operating cost per mile of passenger cars on hard-surfaced roads is 10 cents and the average operating cost of trucks on hard-surfaced roads is 36 cents, assuming traffic of 300 vehicles a day, 90 per cent passenger cars and 10 per cent trucks, and operating costs on dirt roads 25 per cent more than on hard-surfaced roads, the annual saving in operating costs per mile per year would be $2,835, using 300 traffic days per year, or more than enough to pay for the annual interest, sinking-fund and maintenance cost for the construction of a hard-surfaced pavement suitable for the traffic.

For a traffic of 600 vehicles per day, divided in the same proportions, the operating savings per mile would be approximately $5,670 annually, and for a traffic of 1,000 vehicles per day the savings would be $9,450 annually by changing from a dirt to a hard-surfaced pavement.

Minimum Construction Time Necessary for City Pavements

C. M. Pinckney, Chief Engineer, Borough of Manhattan, New York, in an address before the American Road Builders' Association convention in 1926, said:

"A city pavement must be of such a type that it can be laid and opened to traffic as rapidly as possible. The minute it is completed, the public demands that it be turned over for use. The closing of one block in a built-up city means congestion in all adjoining streets, with its consequent loss of business, fire hazard and general inconvenience. A city pavement must be of a type capable of quick repair, permanent repair and easily cleaned. It should resist, as far as practicable, the destructive effects of illuminating gas, gasoline, oil, steam and fire.

"Do not select a pavement which you have no facilities to maintain. The salvage value of the old pavement is a factor worth considering.

"The first cost of city pavements usually staggers the engineer. Don't let the first cost take precedence over the ultimate economy. There can be no greater fallacy than that cheapness in pavements means economy. Spreading pavements over as great an area as possible is false economy.

"Habit of selection is not wise selection. Keep informed through the many channels open to you of what the world is doing in paving, and the exact type you are seeking will be found to fit your requirements to the letter. A knowledge of all types of paving is one of the first essentials to the selection of an engineer as well as the pavement."

Comfort and Convenience of Highway Users

One of the most important factors in the selection of pavements for rural highways as well as large and small centers of population is the consideration of comfort and convenience of the highway user. Where there is any appreciable amount of traffic, the most suitable pavement is the one that will require the least amount of repairs, that can be economically repaired with the least delay to traffic, and a pavement with a very long life, so that the inconvenience and additional transportation and related costs due to reconstruction can be avoided as long as possible.

Closely Built-up Sections

In closely built-up sections of cities and smaller communities, where there is always more or less of a likelihood of its being necessary to cut into pavements to repair conduits, sewers, service connections and street-railway tracks, it is particularly important that the type used should be one that can be easily and quickly repaired and at a moderate cost.

The Art of City-Building

This is the age of cities, and all the world is city-building. In a dim sort of way many persons understand that the time has come when art and skill and foresight should control what so far has been left to chance to work out; that there should be a more orderly conception of civic action; that there is a real art of city-making, and that it behooves this generation to master and practice it."—MacDonnell.

THE LAGOON, LAKE FRONT PARK, GARY, IND.

Gary—an Industrial City with a Fine Recreation System and Exceptional Park Buildings

By RUTH SUTLIFFE

THE story of Gary, Ind., from the date 22 years ago when the first stakes for its site were driven, to the present time of its prominence as one of the world's greatest steel centers, involves the story of the development of a remarkable park and recreation system. The system contains eight parks with a combined area of over 600 acres, and more than 18 miles of boulevards bounded by plantings of shade trees and ornamental shrubberies. The recreation buildings which have been provided as a part of the park properties are exceptionally attractive, pleasantly varied in architectural design, and well conceived, each to serve the particular purpose for which it was provided.

Two recreational areas, the East Side Park and the West Side Park, were laid out when the city was founded. The one was landscaped, provided with a bandstand, and otherwise planned as a center for public gatherings. The other was designed to preserve the typical contours of the sand-dune country, though to this end a deep ravine had to be filled, and much planting done. Tolleston Park, a 20-acre tract, was later developed with landscape planting and facilities for active recreation, including a children's playground, a baseball diamond, tennis courts, and athletic fields. As city congestion grew, the United States Steel Corporation donated Tyler Park, which is located in the heart of the industrial section where it serves people of almost every known nationality and is widely used for Americanization and educational purposes as well as for play. The pavilion there was constructed as a community center at a time when the only halls available to the people of the neighborhoods were rooms over saloons.

Jackson Street playground, the next to be developed, is equipped with modern playground apparatus and tennis courts, and has a wading pool and a shelter house. The athletic field is used as a skating-rink in winter.

The most recent addition is Washington Park, with an area of four blocks. This will be developed after the manner of Tyler and Tolleston Parks.

It took Gary twelve years to achieve a lake front park, principally because desirable land lay outside the city limits and its acquisition involved litigation. Finally, however, the United States Steel Corporation purchased and presented to the city a tract of 115 acres, which by additional purchase has increased to 135 acres. This gives a lake frontage of approximately two miles. A combined restaurant and pavilion was placed here in an incomparable setting. Watchmen and life-guards are provided at the beach, and a small emergency hospital has been built and equipped with a pulmotor and other first aid equipment. Powerful floodlights on 90-foot structural steel towers aid the guards in making night swimming safe, and at the same time illuminate the surrounding recreation areas. Playground equipment has been installed on the beach and in other sections of the park. Picnic tables and brick ovens have been built and also a huge oven for barbecues.

In 1924, the Park Commissioners, through the institution of condemnation proceedings, obtained 300 acres of swamp land, which has been drained, filled, and landscaped. Riverside Park, thus developed, contains tennis courts, an 18-hole golf course, baseball diamonds, playgrounds, and an attractive clubhouse. Plans for further development of this park include the provision of a

BATHING PAVILION, LAKE FRONT PARK, GARY

swimming pool, a sunken garden, a conservatory and a zoological garden. It is expected to be among the most splendid inland recreation centers in Indiana. In addition to all these beautiful acreages, Gary has several small areas dedicated to park and recreation purposes.

Six Beautiful Buildings

Because of the attractiveness of Gary's park buildings, and the exceptionally wide variety of uses represented by these buildings, a brief description of each will be given:

The bathing pavilion at Lake Front Park, one of the finest in the country, was built at a cost of $300,000. The architecture is modified Greek, and the general layout, adopted by the Park Board after investigation into the best existing examples of such structures, includes a central portion and two unroofed wings. The men's and women's locker rooms (containing about 2,000 lockers, with gable roofs of corrugated steel) the shower-baths and rest rooms, are housed in the roofless wings. The central section, with graceful supporting columns, has two winding stairways leading to a spacious promenade above. The structure is of concrete in block form and is roofed with green tile.

The recreation pavilion at Lake Front Park is a $350,000 structure and is also of modified Greek architecture. It has been designed especially with relation to the contours of the ground. It is of cream and tan brick, with a dark-green tile roof, blending beautifully into the landscape of dune sand and green foliage. On the first floor are rest rooms, offices, and a cafeteria which is open the year round. At the rear is a large veranda with steps leading to the lagoon, which provides opportunity for both winter and summer sports. The large second-floor dining-room seats 500, and opening from it is a large open-air dance floor where 200 additional guests may be seated. The kitchen is completely equipped with electrical apparatus.

WEST SIDE PARK SHELTER HOUSE AND OFFICE OF PARK COMMISSIONERS, GARY

The Riverside Park club-house is of English architecture and is developed in soft red-toned bricks with its gables of stucco and half-timbers. Its cost was $50,000. The lunch room and gathering place is a large story-and-a-half room with rough plaster walls and exposed beams. The two wide verandas face, one on the tennis courts, and the other on the golf links. Locker and rest-room provisions complete the equipment.

The Tyler Park building is Spanish in its architecture and is of white cement with an overhanging green tile roof. Its cost was $15,000. It provides a large dance hall, a long entrance hall and cloak and rest rooms. The pavilion at Tolleston Park is a similar building, but somewhat smaller in size. Its cost was $12,000. In addition to the retiring room facilities provided in the $20,000 West Side Park building, the Commissioners' office and drafting and work rooms are there, being housed on the second floor. The Washington Park building is to be of Spanish design also. It will be provided with play apparatus and tennis courts. There also will be a wading pool and an athletic field. The area is now but a stretch of barren sand, but the proposed covering of black soil and the planting of many trees and shrubs will transform it within a short time.

The photographs of these buildings were provided especially for use in THE AMERICAN CITY through the courtesy of W. P. Gleason, superintendent of the Gary Steel Works. Mr. Gleason was one of the pioneers in the development of the city. He has contributed materially and constantly to making Gary what it is—not only one of the greatest steel centers in the world, but also a pleasant and beautiful home city for steel workers.

(*See front cover for other photographs*).

Architectural Control Forecast for Rural Preservation

PUBLIC censorship over private building schemes—a question which is beginning to force itself upon the consciousness of American city planning authorities as a very desirable, if possible, next step in the science of building permanently beautiful cities—was advanced as a logical concomitant of the future regional planning and rural preservation of Great Britain, particularly of the Scottish Highlands, in a recent paper before the Town Planning Institute of Great Britain, by G. D. Macniven, Fellow of the Royal Institute of British Architects and Principal Architect, Scottish Board of Health.

The question was recognized as a delicate one, for "admittedly cultivated tastes vary and standards of beauty change.

"We appear, however, to have achieved unanimity in thinking that highly colored advertisement hoardings are out of place in rural surroundings, and proper supervision over the erection of such hoardings may be adequately provided for in town planning schemes or even in local bye-laws. But the more subtle distinctions between good taste and bad defy legal definition and cannot be governed by the definite provisions of a scheme. In Edinburgh, the Corporation have taken power not in a town planning scheme, but in a local Act, to require the amendment of plans that in their opinion would be injurious to amenity. The Corporation in coming to decisions on this question are assisted by an Advisory Committee whose four members are appointed by the Secretary for Scotland, the Royal Scottish Academy, the Incorporation of Architects in Scotland, and the Corporation respectively.

"It may not always be convenient or possible for local authorities to insert such provision in a local Act, but similar committees may be set up under all town planning schemes, and I think *the desirability of such provision applies with particular force to rural areas*, where the range of vision is so much wider than it is in towns, and where errors in taste are correspondingly more far-reaching in their effects. I have no doubt that before long the establishment of properly qualified and disinterested tribunals for the criticism and, if necessary, the enforced amendment of plans of buildings which, if erected, would be detrimental to the esthetic value of their surroundings, will be regarded as a normal and necessary safeguard and no more strange than the control which is now exercised in matters of health, sanitation, and stability under existing bye-laws."

A War of the Centuries

Some of the Highlights in Man's Everlasting Struggle Against Fire, as Chronicled by Dr. C. V. Tower, Professor of Philosophy at Ursinus College

(Drawings by Edna Hood Lissak)

ANCIENT Rome had its devastating fires, just as New York, Chicago and San Francisco, but the fire fighters of centuries ago were handicapped by equipment, the crudity of which is apparent from the historical outline of fire prevention work which Dr. C. V. Tower has prepared.

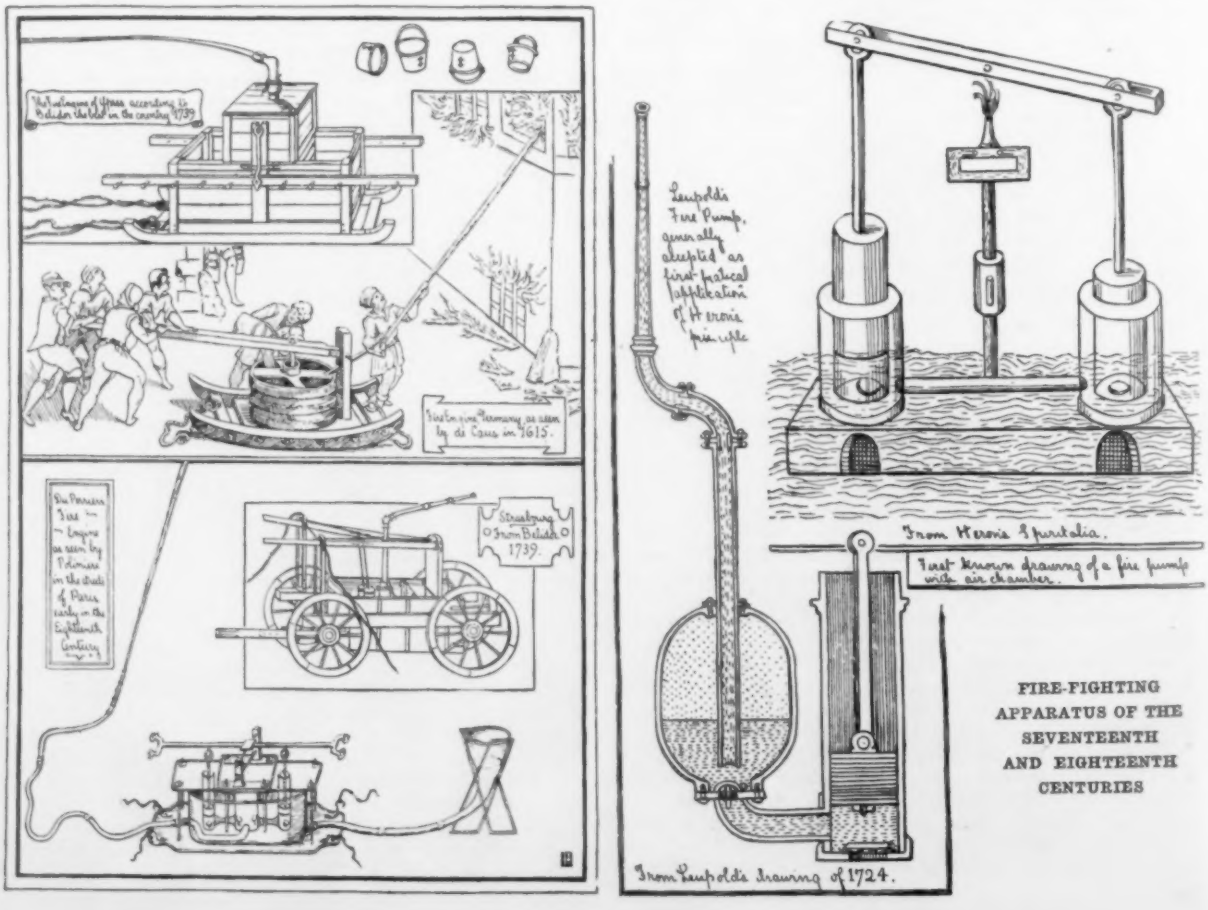
While in the days of Marcus Aurelius disastrous conflagrations were often considered "acts of God" and consequently unpreventable, Rome nevertheless had its fire brigades, Dr. Tower writes in a recent issue of *The Edison Monthly*. But what ineffective and clumsy contrivances they utilized, compared with the powerful apparatus of the 20th century fire department in any large city!

The cry "To the water!" "To the water!" evidently did duty for the modern telegraphic signals in those days when buckets, ladders, hooked poles and siphons were the sole fire-fighting apparatus. About the year 6 A. D., however, Augustus is said to have called into being his seven cohorts of fire-fighting policemen, combining, as it were, two municipal departments in one. Dr. Tower reports that each cohort was under the control of a prefect and numbered 1,000 men who patrolled the streets at night with only their torches to light the way. This obviously inadequate contingent for a city of nearly 1,000,000 inhabitants was forced to cope with frequent fires of huge proportions, which generally yielded but slightly to their valiant efforts.

Skyscrapers Limited to Height of 60 Feet

Rome's skyscrapers are reputed to have added to the fire hazard until their height was limited to 60 feet. There were engines of a sort, Dr. Tower discloses, the small siphons no doubt being worked by hand. Long before, Otesibius had invented the force pump, but no effort had been made, evidently, to render practicable Heron's conversion of the principle into a fire engine. The latter invention, the first known fire engine with an air chamber, dates possibly from the third century B. C. It consisted of two brass cylinders, partly immersed in water when in operation, connected with a discharge pipe and accurately fitted with smoothly working pistons. Leupold's one-cylinder fire pump, an early 18th century invention, is the first known adaptation of Heron's principle.

Dr. Tower finds that portable "fire engines" of the type later known as the "squirt" are mentioned in the fourth century and again in the seventh. The term "engine" was a blanket term, however, covering almost anything with a suggestion of the mechanical, so that the efficiency of such fire apparatus may be reasonably doubted. The squirt reappeared in the sixteenth century and, in one form or another, was used until the beginning of the nineteenth century, when laws making it an offense to be


Leupold's Fire Pump, generally accepted as first practical application of Heron's principle
From Heron's Spiritalia.
First known drawing of a fire pump with air chamber.
From Leupold's drawing of 1724.

FIRE-FIGHTING APPARATUS OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES

unprovided with hand squirts were still unrepealed in England, the author relates. The instrument was usually of brass and held from two to four quarts of water, the smaller squirt being about 2½ feet long, with a half-inch nozzle. Three men were required to operate it, one on each side to hold the cylinder and nozzle (immersed in water), a third to pull back the piston and charge it.

"Besson's squirt must have seemed to the people of that day the last word in fire-fighting apparatus," Dr. Tower states. "'This kind of squirt may be made to hold a hoggeshed of water, or if you will a greater quantity thereof, and may be so placed on his frame, that with ease and small strength, it shall be mounted . . . and made to squirt out the water upon the fire that is to be quenched,'" it was written at the time.

In the next century, however, Du Perrier (probably the first real fire chief) was empowered to build and supply engines of the new Dutch type. His firemen are reported to have been resplendently garbed and to have maneuvered their portable pumps and other equipment by whistle signals. Hautsch of Nuremberg improved the hand engine, Dr. Tower declares, and built a large machine which was drawn by two horses and worked by twenty men. It was mounted on a sledge and threw water from a portable cistern to the height of 80 feet, over the houses of that day.

A FIRE ENGINE WORKED BY TWENTY MEN

America't First Fire Engines

While Du Perrier was making progress in Paris, Newsham in England was working upon a new type of engine, which, with modifications, was destined to retain the favor of firemen for about 100 years. The engine was equipped with two pumps, worked by a double lever provided with long handles, augmented by the alternating application of foot power to the two treadles upon the box covering the pumps. In 1731, the Common Council of New York City ordered that two of these engines be procured from London, together "with Suction and Materials thereunto belonging, for the Publick service." These, Dr. Tower says, were the first fire engines in America.

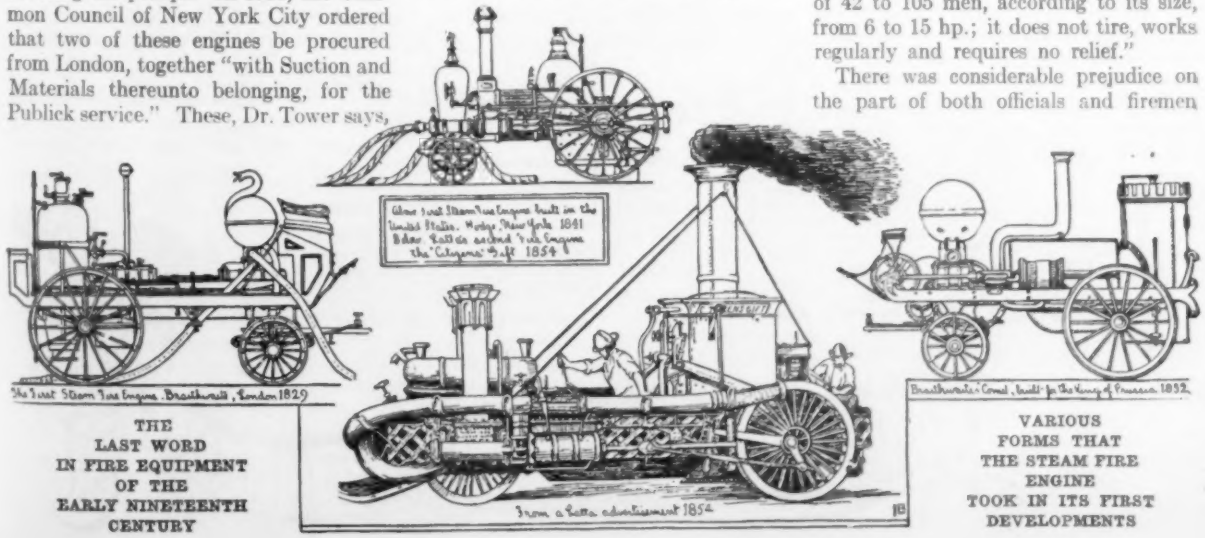
As representative of engines which followed these, Dr. Tower recalls a Centennial prize-winning steam fire engine of Frederick, Md., "Lillie of the Swamp" by name, which appeared in the firemen's parade at Washington on September 3, 1928. With its gleaming nickel-plated air chamber and brass smokestack, the little engine seemed fit after 50 years of service. Long before Lillie's day, however, steam fire engines had been in existence, according to the author. As early as 1828, John Ericsson, best known as inventor of the "Monitor," had designed the new fire-extinquisher, which he mounted on a rude carriage for experimental purposes.

"The trials proved so satisfactory," said Ericsson, "that Mr. Braithwaite, who built this first steam engine, decided to make another, to be mounted on a light frame suspended on springs suitable to run on pavement for practical purposes. I accordingly at once designed the second steam fire engine . . . the machine proving a perfect success on first trial." It was smaller than the first but a more powerful pumper, throwing 168 gallons of water a minute to a height of 109 feet.

An Engine Which Did Not "Tire"

A third engine followed, built for the Liverpool docks. Then came the "Comet," which Dr. Tower says was designed by Ericsson and Braithwaite. It was a 15-hp. engine, weighing 4 tons, having two cylinders and two pumps of 10½-inch diameter, designed to work at 18 strokes a minute and, in the same fraction of time, deliver 304 gallons of water, ejecting the stream from its 1¼-inch nozzle to a vertical height of 120 feet. A German newspaper speaking of the engine said: "It saves the strength of 42 to 105 men, according to its size, from 6 to 15 hp.; it does not tire, works regularly and requires no relief."

There was considerable prejudice on the part of both officials and firemen


The first Steam Fire Engine. Braithwaite, London 1829
From a Latin advertisement 1854
Braithwaite's Comet, built for the King of Prussia 1852

THE LAST WORD IN FIRE EQUIPMENT OF THE EARLY NINETEENTH CENTURY

VARIOUS FORMS THAT THE STEAM FIRE ENGINE TOOK IN ITS FIRST DEVELOPMENTS

towards these new steam fire engines, Dr. Tower states, and the first one of American manufacture, which was built in 1841 by Hodge, an English engineer, was rejected by the firemen and soon retired from service. Early builders were unable to produce a satisfactory engine that would run to fires under its own steam until Latta built the "Uncle Joe Ross," a very heavy machine which was placed in service in Cincinnati on January 1, 1853. But even this and other pumpers of similar type were usually drawn by horses, only a part of the propelling power being furnished by the engine itself, says Dr. Tower. Cincinnati has the distinction of being the first city to have a paid fire department, inaugurated in 1853 also. To Philadelphia goes the distinction of having the oldest fire insurance company in America, he adds, and the first fire association (1817) which grew out of the volunteer fire department of any city.

Latta's second steam engine was described as a "splendid machine," costing $10,000, with a steam-raising record of 3 minutes and 1½ seconds. The machine threw a horizontal stream through a 2½-inch hose and a 1½-inch nozzle a distance of 297 feet.

The Modern Fire Apparatus

Steam fought fire for 70 years and gave ground stubbornly to the new gasoline or electrically driven pumpers, predecessors of the present-day engines, says Dr. Tower. The electrically driven pumper, he believes, is probably less than 30 years old. In various cities of the United States, electric engines have been put in operation and eight of them, according to the author, may be seen in Camden, N. J., and others in Paterson, N. J.

Bringing his outline to a close, Dr. Tower comments on the complicated nature of the modern fire engine, which he terms "an assemblage that is mechanical from beginning to end and requiring the services of skilled engineers to pass upon its qualifications and performance." These engines of the present era vary in pumping capacity from 300 to 1,500 gallons per minute. They carry more than 1,000 feet of 2½-inch hose and, when provided with a chemical tank, additional 1-inch hose for use at small fires.

Such in skeleton form is the story of how mankind has waged relentlessly, and with increasing success, a war of the centuries against fire.

Inferior Construction—A Chief Enemy of Fire Prevention

MUNICIPAL building codes should embrace those provisions for safeguarding against fire which the more progressive architects are adopting, according to the Kentucky Actuarial Bureau. In the past, the three elements of appearance, arrangement, and cost have been of prime importance, but the Bureau now finds that safety from fire is a chief concern.

"The designer who is not concerned with the factor of safety from fire not only frequently jeopardizes the lives of the occupants, but fails to protect properly the interests of his client. Nearly all buildings are insured and the fire insurance rate is based upon a careful analysis of the construction, segregation and safeguarding of fire hazards, protection of exterior and interior openings and the protection afforded by automatic sprinkler systems, standpipes and other 'first aid' devices. Failure to consider these features results in an increased insurance rate, which increase is a charge against the building and its contents as long as the building stands."

Several common faults in construction and planning which serve to emphasize the need for safe building on the part of the designer, are listed by the Bureau thus:

"Concrete moving-picture booth built without provision to carry off the flame and smoke from burning films. Booth was condemned and owner put to much expense and loss of rentable space to provide for necessary ventilation.

"Standard wired glass (windows) for protection against a severe exposure installed in wooden frames. These windows are of no more value than ordinary glass, and the risk carries a heavy exposure charge.

"Standpipe risers improperly located, with the result that all parts of the building cannot be reached with the maximum amount of hose permitted.

"A small, yet extremely hazardous, part of a manufacturing process not cut off from remainder of risk by a fire-wall with openings protected by standard fire-doors.

"A large building designed for two separate occupants rated as one risk because blank interior wall does not extend through roof.

"Metal ventilating duct from hood over range in restaurant on first floor carried up through building. Duct in contact with wooden floor timbers, making a very hazardous installation.

"Fuel-oil heating system with supply tank improperly installed in basement.

"Large heating ducts passed through fire-wall without automatic cut-offs. A hazardous feature, as a fire in one section of the plant can readily pass into adjoining section.

"Standard fire-doors on communications between two buildings hung on wooden frames.

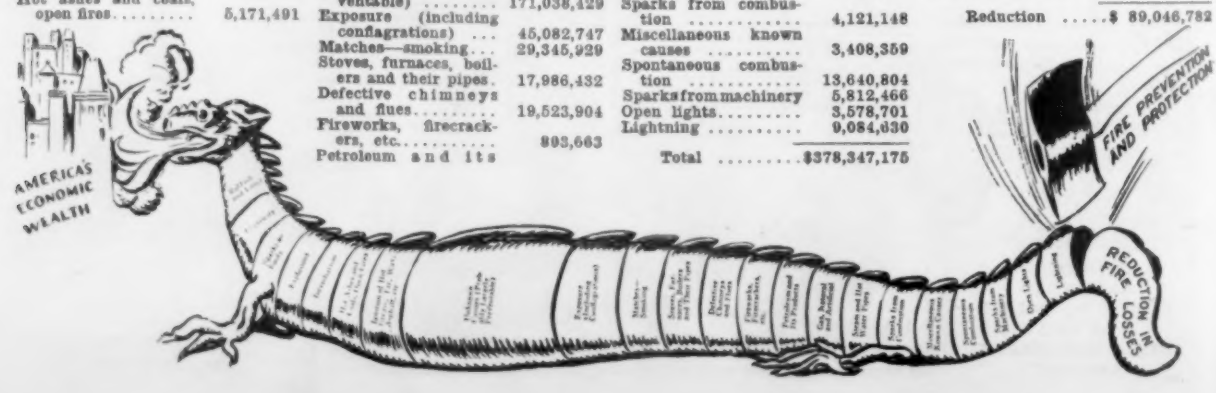
"Underground gasoline storage system with fill, vent and inventory pipes inside building.

"Roof of palatial dwelling covered with wooden shingles which are a menace not only to this dwelling but to surrounding property."

The Dragon That Consumes a Half-Billion of Property Value Annually

The 1927 fire losses in the United States, recently published, as estimated by the National Board of Fire Underwriters and graphically represented by the segments of the dragon, which appeared in the Board's publication, "Safeguarding America Against Fire," were, by causes:

Rubbish and litter	$ 1,035,454
Electricity	12,360,558
Sparks on roofs	11,256,303
Explosions	4,725,857
Incendiarism	2,403,615
Hot ashes and coals, open fires	5,171,491
Ignition of hot grease, oil, tar, wax, asphalt etc.	1,699,208
Unknown causes (probably largely preventable)	171,038,429
Exposure (including conflagrations)	45,082,747
Matches—smoking	29,345,929
Stoves, furnaces, boilers and their pipes	17,986,432
Defective chimneys and flues	19,523,904
Fireworks, firecrackers, etc.	893,663
Petroleum and its products	12,691,718
Gas, natural and artificial	3,100,828
Steam and hot-water pipes	184,931
Sparks from combustion	4,121,148
Miscellaneous known causes	3,408,359
Spontaneous combustion	13,640,804
Sparks from machinery	5,812,466
Open lights	3,578,701
Lightning	9,084,830
Total	$378,347,175
25 per cent to cover unreported losses	94,586,794
Grand total	$472,933,969
1926 grand total	$561,980,751
Reduction	$ 89,046,782



Is Government Aid Necessary in the Financing of Low-Cost Housing?

ANSWERING this question in the affirmative at the National Housing Conference, in Philadelphia on January 28, Mrs. Edith Elmer Wood, internationally known as an exceptionally keen student of housing problems, defined "government" as meaning any public authority—national, state, or local; and "aid" as meaning anything that helps—by no means necessarily a subsidy. "The erroneous impression," said Mrs. Wood, "that government aid is equivalent to government subsidy is at the root of most of the emotional hostility to government aid to housing in the United States today."

Citing various forms of government aid to housing in Europe—much of it without actual subsidy—Mrs. Wood pointed out that in the post-war work the subsidy where employed is regarded as a part of the cost of the war. As to the results accomplished, Mrs. Wood said:

Results in Great Britain, Holland and Germany

"Great Britain is carrying out a fifteen-year program for the building of 2,500,000 small homes, financed by government loans and, so far, aided by subsidy, though the amount is diminishing progressively. Today, over 1,000,000 such homes are built or building in England and Wales and over 100,000 in Scotland. Nearly half in England and Wales are the work of private builders who sell at a supervised price to small-income white-collar families. More than half (a much larger proportion in Scotland) are built by local authorities to rent to working-class tenants. This represents the re-housing of about one-ninth of the population. The standard set is extremely high, especially in England, where single-family brick or concrete cottages are built containing five or six rooms and a bath, hardwood floors, electric lights and gas range. Those built by local authorities are in open layout, 12 to the acre in cities and 8 in the villages. There are gardens, shrubbery, tennis courts and playgrounds.

"Holland has done even more in proportion to population, for she has, during the past few years, re-housed no less than one-fifth of her people with government credits and subsidies. Most working-class groups there are housed by cooperative societies. Municipal housing is chiefly residual. It has come to be recognized that for a small group below the line of self-support, housing will always have to be subsidized. For all others, it is now back on the pre-war basis.

"Germany, also, in spite of her financial condition, has built more than a million apartments and cottages for her workers since the war and has been rewarded by a striking drop in her death-rate, which is now lower than that of the United States. So also are the death-rates (general and infant) of England and Holland. Those of London are lower than those of New York.

At the Tenth National Conference on Housing in America

held in Philadelphia, January 28 to 30, under the auspices of the National Housing Association in cooperation with the Philadelphia Housing Association, special attention was given to problems of slum clearance and low-cost housing. In addition to the two papers here abstracted, there was an important address by Lawrence Veiller on "A Slum Clearance Policy and Program," the stenographic report of which is not available as this issue of THE AMERICAN CITY *goes to press. An abstract of Mr. Veiller's address will be published in this magazine next month, together with excerpts from Bernard J. Newman's notable paper on "What the Rest of the Country Can Learn from Philadelphia."*

Among other subjects discussed at the Philadelphia conference were:

"New Ideas in Developing Residential Districts"

"The Home and Its Problems"

"Housing and Planning"

"Building Methods and Materials"

"Housing and Health"

"The Monster City"

The complete report of the conference will be published in book form, and will be obtainable from the National Housing Association, 105 East 22d Street, New York.

"In all this post-war work, the subsidy is regarded as part of the cost of the war. Housing with government aid had reached the stage of rapid expansion in 1914. England and Germany had each produced by these means more than 100,000 homes, *without subsidy*. Had there been no war, there would have been no subsidy (except in connection with slum clearance), and the amount of building done would undoubtedly have been greater than what has actually taken place under the handicap of subsidy.

"Having made it reasonably clear, I hope, what form of government aid in house financing we are talking about, and that it has proved its usefulness abroad, it remains to be shown why we need it in the United States.

Only a Third of the Population in America Can Afford to Buy or Rent a New Home

"The housing problem, here as elsewhere, is fundamentally economic. The distribution of income and cost of building are such that only a third of the population can afford to buy or rent a new home. This is demonstrable if there were time. Taking the country as a whole, about a third of our families have incomes of $2,000 and over. The middle third range from $1,200 to $2,000. The lowest third have less than $1,200. The top third are well housed, the middle third only fairly, the lowest third badly. Their health, morals, efficiency and family life are being seriously damaged. Only the top third can control their environment without help.

"Any radical improvement in the situation implies the building of a large number of new homes and the scrapping of a large number of bad old ones. This will never be done by private business initiative, because not even the middle group, much less the lowest one, can pay a profit on a new home. When the wants of the top third are supplied, commercial building ceases. Middle-group families can occasionally buy an old house, with the help of the building and loan association, but not a new one. Limited dividend housing helps a few members of the middle-income group to better housing than they could otherwise attain. But there isn't anywhere near enough of it, nor does it cut prices far enough.

"This is where the policy of government housing credits, to cooperative and other limited dividend housing companies, officially approved and supervised, would come to the rescue, since it would permit the building of new homes for the middle group, whose wants in that direction must now remain unsatisfied. It would probably not bring new housing within the reach of the lowest-income groups, but they could move up a grade into the homes vacated by the middle group. The worst of the old houses could eventually be scrapped.

"*It is clear that this would, so far, involve no subsidy.* It would not interfere with the work of the private builders, who would continue to cater to the only section of the population which they have ever supplied. Contractors, material men and building trade workers ought to welcome a policy which might double their activities."

Helping a Large and Worthy Class to Secure Decent Housing

Though expressing her admiration for

the work of the building and loan associations, Mrs. Wood pointed out that they do not and cannot solve the housing problem for the lower-income groups. She urged strongly, however, that the benefits of the proposed state-controlled housing loans should be carefully limited to those below the income groups which can use the machinery of the building and loan associations. In conclusion, the speaker said:

"What I have described, however inadequately, is the logical next step for us in the United States. It would help a large and worthy class to achieve better homes. Whether it would prove sufficient by itself to solve all our housing problems can be told only after a full and fair trial. It did not prove enough in Europe. They had to adopt municipal housing and slum clearance. But the financial status of our workers may be enough better here, so that loans will suffice. If not, there are the steps beyond which may be taken.

"If, after trying out all that can be done without municipal housing and without subsidy, there is still a badly housed residuum, need we be unduly terrified at the thought of taxing ourselves for slum clearance and re-housing? The one-per-thousand difference between the death-rates of England, Holland, Germany and our own means 120,000 preventable American deaths each year. The number would be much larger if the New Zealand death-rate were the standard of comparison. It would be worth some outlay, even on economic grounds, to save that number of American lives. Our annual crime bill is variously estimated at from 7 to 13 billion dollars. If even a tenth of it can be traced to bad housing in early life,—and it is probably much more,—common sense might seem to dictate a preventive investment for the future. The determining of American housing policy calls for efficiency engineering of the highest type and a well-developed sense of proportional values."

Private Effort and Public Action Must Unite for Effective Slum Improvement

USING the word "slum" in a sense broad enough to cover all housing which, because of its poor construction or dilapidated or insanitary construction, is unfit for human habitation, Harold S. Buttenheim, Editor of THE AMERICAN CITY, presented a discussion of "Slum Improvement by Private Effort," at the National Conference on Housing in America, held in Philadelphia, January 28-30. Based on testimony received from chambers of commerce and housing associations in 90 cities of over 30,000 population, and from previous studies of housing problems, the speaker outlined his conclusions as follows:

1

"Neither by private effort alone nor by public action alone, can American cities hope for salvation from present and future slums.

2

"Until the millennium arrives, private effort will need the compulsion of law, the results of systematic research, and the stimulus of organized public opinion, for an effective attack on problems of slum improvement and low-cost housing.

3

"The compulsion of law should include city-planning and zoning ordinances, housing acts, building and sanitary codes, and restrictions on density of population—all of them much more drastic than now exist in most states and cities.

4

"Such enactments, if properly drawn and enforced, would hasten the reconditioning of houses worth saving; the demolition of unconvertible slums; and the building of modern, sanitary dwellings of sound construction and with ample open spaces.

5

"Public effort has opportunities for increased service, also, in the beneficial effects on slum improvement and slum prevention which come from street paving, street widening, the installation of sewerage systems, and the educational activities of fire and health departments.

6

"Greater efficiency of organized civic effort is needed, to the end that hard-headed complacency and capital seeking investment and philanthropy seeking a constructive outlet may come to realize, more generally than at present, that improvements in the housing of the lower-income groups of our cities are economically possible and of fundamental social importance.

7

"There will be general agreement, I believe, in the soundness of the conclusions stated in the six preceding paragraphs. It is safe to say, also, that conservatives in increasing numbers are joining with the liberals in advocating exercise of the power of excess condemnation in street-widening projects, and perhaps in giving to the limited-dividend housing corporations, under proper safeguards, the right of eminent domain in acquiring land for low-cost housing.

8

"We then come to the moot questions of tax exemption, state credit, and municipal ownership. These are outside the topic assigned to me; but no discussion of "Slum Improvement by Private Effort" would be adequate without pointing out, as I have done, that public effort of certain kinds is essential to the efficient functioning of private effort. The question of where to draw the line is a difficult one. All—or almost all—of us would draw it this side of government housing. We want our public bodies to stimulate slum improvement and better housing by prohibiting the bad and encouraging the good; but we prefer to leave to private effort, rather than to the state or municipality, the actual building and ownership of houses. We do not favor public subsidies; but some of us would not be greatly alarmed to see other cities try out the method of taxation of conservative Pittsburgh, whereby all buildings are less heavily taxed in proportion than land; nor would we object to see in Michigan, as proposed by the Michigan Housing Association, a demonstration of whether public funds can be loaned, without ultimate cost to the public, for the building of wage-earners' homes, with success similar to that which California is having in the financing of homes and farms for her veterans by state loans aggregating already more than $25,000,000.

9

"However our opinions may differ on these moot questions, we can all agree, I am sure, as to the importance of more thorough research into the possibilities of reducing housing costs by economical financing, improved architectural design, better site planning and new methods of construction. Investigation should be made, also, as to the methods whereby workingmen's homes are being built and sold, in certain cities, at a cost much lower than seems possible in other cities. Another fruitful field of research is to study the reasons why cities which have no bad housing conditions—if there really are such—have remained slumless, and the worth-while lessons which other cities can learn from their good example.

10

"By methods such as these it may be possible, without actual subsidy from the public treasury, to bring to our leaders in science, industry, finance and real estate development, a realization of the fact that the making available of decent, sanitary housing for every American family is a problem now receiving but a fraction of the constructive thought and vigorous leadership which its outstanding importance demands. And we shall go far towards solving these problems if there can be brought to the production of dwellings any such degree of imagination, technical skill and business ability as has gone in recent years into automobile production and other twentieth-century business enterprises."

Is America So Crowded That Its Citizens Must Live—and Die—in Congestion Such as This?

International Newsreel Photo

A RECENT FIVE-ALARM FIRE IN A TENEMENT-HOUSE SECTION OF BROOKLYN, N. Y.

Is your city safeguarding itself, by adequate building codes and zoning ordinances, against similar deplorable conditions?

THE CITY BLOCK IN CHICAGO'S SOUTH SIDE THAT IS BEING DEVELOPED TO HOUSE 417 NEGRO FAMILIES

Decent Housing for Negroes

A Demonstration in Chicago of the Possibility of Making Negro Housing a Large-Scale Business Enterprise

By ALFRED K. STERN

DIRECTOR, JULIUS ROSENWALD FUND, CHICAGO, ILL.

THE providing of new, modern housing accommodations in sections of Chicago where large numbers of Negroes live has until recently received little attention from white capital. Negro contractors have from time to time built new dwellings of the two,- three-, and four-apartment types, and a few individuals have built bungalows. The total results, however, have been meager. In neighborhoods where white people formerly lived, Negroes have moved either into large homes from ten to fourteen rooms or into apartment buildings many of which were badly in need of major repairs.

High Rent for Poor Quarters

Notwithstanding the already heavy depreciation in the value of some of these buildings, the rents to newcomers were increased from 20 to 35 per cent. These increases necessitated the doubling-up of families or the securing of roomers to help meet the excessive rents charged. These high rates also set in motion social and health problems which were inimical to a normal family life.

How best to remedy such a situation has been a problem of grave importance since the early days of Negro migration. Apparently what was needed, where land costs were high, was housing on a large scale, containing three-, four-, and five-room apartments which could be rented to families of moderate income. The erection of a building on such a scale, if a suitable return be made, in addition to providing decent housing, will induce capital to erect this type of housing not only in Chicago, but in other cities as well.

As far back as 1914, Julius Rosenwald considered a housing demonstration in Chicago. Land was purchased and plans drawn for an attractive apartment building. But after careful study of costs, it was found at that time that the financial status of the colored people living in Chicago was not sufficiently high to enable them to pay contemplated rents which would net a fair return on the investment. Since then the economic condition of the colored people has greatly improved—so much so that Mr. Rosenwald was induced in 1927 to reconsider a housing demonstration.

A committee of business men was formed with E. E. Brown, Vice-President of the First National Bank, as Chairman, to study the living conditions of colored people, in the light of modern housing accommodations. A survey of the better income group was made by Miss Irene Graham under the direction of Miss Edith Abbott, Dean of the Graduate School of Social Service of the University of Chicago. This survey disclosed the need of apartment buildings of the three-, four-, and five-room type as contrasted with the large number of old apartment buildings containing six to nine rooms, now being used. In other words, the opening-up of new areas during the past few years containing these large apartments, where much of the high rents prevailed, had not lessened the need of apartment buildings of the smaller unit type in which a large proportion of the better-income group could live without necessarily resorting to roomers in order to pay the rent.

A Large-Scale Experiment

The findings of the committee as a result of this study induced Mr. Rosenwald to purchase an entire block of land on the south side of the city between Michigan and Wabash Avenues, and 46th and 47th Streets.

On this site there is now being erected one single building five stories high, covering less than 40 per cent of six acres of land. This new building will provide 417 apartments with a total of 1,641 rooms. These apartments will contain from three to five rooms each, the great majority being four-room suites. The project will have a central oil-burning heating system, electrical refrigeration and combination bath and shower. The apartments will be attractively decorated. Developing an entire block will make it possible to give much attention to a large central garden which will cover over three acres of the land. There will be a playground for the smaller children in the garden. A modern nursery school will be conducted in the building, directed by a teacher specially trained in the latest nursery school methods.

The building will be of full fireproof construction with every regard to safety, comfort, convenience and health. The entire cost of the project will approximate $3,000,000. It is the thought of Mr. Rosenwald that these excellent homes under good management will contribute to the health and morale of the community in providing opportunity for a new standard of living.

It is of course evident that apartments for 417 families represent in themselves but a small contribution toward solving the housing problem of Chicago. If it were not expected that the results would be more far-reaching than providing for the adequate living of a few hundred families, Mr. Rosenwald would not have given the problem much thought. What he expects to do is to demonstrate by this experiment, first, that attractive, modern, healthful, housing can be built; second, that it can be offered not at a low but at a moderate rental; and third, that it will give a business return—6 per cent or better—on the money invested. So far as this experiment is successful in all three of these ends, he will not only have financed a large building project, but he will also have influenced the whole problem of better housing for all groups in Chicago and, it is hoped, in other cities.

The third of these conditions—that of making sure a return of at least 6 per cent on the capital invested—cannot be determined until after a period of operation. If cheap, unhealthful buildings were built, it would be very easy to make from 8 to 12 per cent on the investment. But the erection of poorly constructed apartments is what Mr. Rosenwald is avoiding in this project. Easiest of all would be to build good apartments, charge low rents, and accept a very small return. But this would be simply a charitable gesture and would be the surest way to warn investors away from this type of thing. In other words, the project will not be a philanthropy. It will be a great economic experiment to see if it is feasible for capital to offer modern, beautiful and healthful living quarters at rents within the reach of the population to be served and at the same time produce a business return on the investment.

Editorial Note.—A somewhat similar project in New York, which has already demonstrated its success, is the Paul Laurence Dunbar Apartments, occupying the large block between Seventh and Eighth Avenues and 149th and 150th Streets in New York. This development, financed by John D. Rockefeller, Jr., contains 511 suites. Two rooms deep, the six independent buildings are set around the outside of a large rectangle, the interior being devoted to gardens and a well-equipped children's playground. Before construction was completed last year the demand for suites had greatly exceeded the supply, and the buildings are now 100 per cent occupied by Negro families to whom they have been sold on an easy payment basis, calculated to bring Mr. Rockefeller an ultimate return of his investment with interest at 5½ per cent per annum. A 13-page mimeographed description of this project, with many interesting facts and figures, is obtainable on request from the Resident Manager, 2588 Seventh Avenue, New York.

A Story-Telling Garden for Central Park, New York

A SMALL and altogether exquisite wonderland created for children, and especially for the little children of the most congested sections of the city, is about to be realized in Central Park, New York, in the Children's Garden. This is being built in memory of Frances Hodgson Burnett, whose books have been a joy and inspiration to so many lovers of flowers, birds and children. Already the site has been selected with the sanction of the Municipal Art Commission, the design has been drawn by Charles Downing Lay, landscape architect, and construction work will start in the early spring.

The central feature of the design is a pool and bird-bath fountain and beside it will be a sheltered bench of pink granite —sort of wonder-bench where the children will sit, surrounded by all sorts of beautiful growing flowers, and feeding-places for birds, and listen to nature stories, some of them told by the city's best instructors in botany and zoology.

Bessie Potter Vonnoh , well-known sculptor, has designed the charming bird-bath fountain group to be cast in bronze. In it a boy, lying on a rock, blows upon a pipe to attract the birds, and a little girl, her eyes fixed upon a small bird flitting past, offers water in a bowl. The group, symbolizing youth, grace and innocence, has been designed to give the little visitors an impulse of purity, beauty and a love of nature's little creatures. This, in fact, is one of the chief aims of the whole undertaking.

There are strong opponents to more statuary and other "cluttering" objects in the already overcrowded area of Central Park. But even the strongest can but be impressed by the perfection with which this little group expresses the park designers' sentiment towards idealistic sculptures, which they felt should in no wise be excluded just because the first menacing crops of unlovely statuary early made drastic control of park "adornment" necessary. "The point chiefly to be guarded against," they thought, "is that there idealistic sculptures shall not dominate the landscape, and thus put those considerations in the subordinate place which in the main work have throughout been assumed to be primary considerations; that is to say, of sylvan or idyllic interest, antithetic to those in which the mind of man is the larger element."

BIRD BATH IN THE MEMORIAL GARDEN

"Country joys are a far cry from the sidewalks of New York," says Marguerite Merington, member of the Children's Garden Building Committee, "To many city children the two weeks' gift of a fresh air fund represents the sum. The greater obligation, then, is to help them find what they can of country in the city's heart. By mobilizing them into groups, with the aid of settlements and schools, it is planned to train them to an intelligent use of parks in discovering some of the treasures in nature's secret garden. It is planned in time to have them issue a regular bulletin recording their own observations, what they note of bird flights, the first star-yellow of forsythia bloom, the behavior of swans, the proclivities of poplars, the visits of scarlet tanagers, the folkways of robins—even to the chatter of sparrows on the window-sills of tenements."

So far as is known this is the first story-telling garden ever planned, but there are a number of other cities where lovers of flowers, children and gardens must have been waiting for this climax idea to their already well-organized park story-telling work and their activities through which school children have been able to establish bird sanctuaries in the parks.

For Fewer and Safer Grade Crossings

Five Steps in a Constructive Program of Joint Action Between the Railroads and the Public

PREVALENT misconceptions about the reasons for, and methods of, eliminating grade crossings must be supplanted by a scientific and economic approach to the problem, in the opinion of E. W. James, of the United States Bureau of Public Roads.

Reporting for the Grade Crossing Committee of the American Road Builders' Association at its 1929 annual meeting in Cleveland, Mr. James first discussed the faults of the present program of grade-crossing elimination, and then outlined a constructive plan of his own.

Erroneous Methods of Approach

"The solution of the problem cannot be approached by a money valuation of lives saved. If each death cost the railroad $10,000, the total cost per year would be $23,710,000. To eliminate all crossings at an estimated unit cost of $75,000, which is conservative, the total investment would be $17,500,000,000, which at 6 per cent would cost the railroads more than one billion per year, or about 50 times the saving in damages. This allows ample margin for damages due to accidents resulting only in injury.

"The matter cannot be approached from the point of view of savings in railroad operation. The trains do not stop for crossings now, and their elimination therefore would not save appreciable time. The saving in crossing maintenance as compared with the maintenance of structures would be negligible as compared with the cost of the structure.

"For the reason that it would obviously disrupt operation and destroy railroad service entirely, it is neither feasible nor just to compel all trains to stop at grade crossings and so create a condition which might be construed as justifying grade-crossing elimination. The railroads cannot carry the cost as a part of a general betterment program. For instance, the Southern Railway, through its Chief Engineer's office, made an estimate of the cost of eliminating all crossings on its lines. The cost slightly exceeded the present total value of the railroad system and all its property. To make such an investment judiciously, it would have to foresee savings or additional income from new business equal to its present income; or else increase its operating efficiency beyond any reasonable expectations. Either of these is totally impossible.

"If we assign half the cost to the public, the solution on any basis mentioned still remains impracticable of justification.

Outlining an Effective Program

"Without going farther with suppositions of this sort, I submit the constructive proposition that the way to meet the problem involves the following:

"(1) A definite classification of crossings based on the relative value to the traveling public of their elimination.

"(2) A definite annual program by each state and each of the railroads in each state, for the elimination of certain grade crossings of highest classification.

"(3) Restriction of the authority to create new grade crossings.

"(4) A definite progressive program in each state for installing safety warning devices of a rigidly standardized type or types.

"(5)The readjustment of the share of the cost of elimination and of the installation of safety devices between the railroads and the public."

Mr. James then discussed in considerable detail the five general propositions composing his program of attack. To determine the relative value of specific elimination, he suggests that a purely economic study be made on the basis of the time lost at crossings under assumed conditions of entirely safe operation. He develops the idea that the value of eliminating the crossing varies directly with the amount of rail and highway traffic, but not with reference to the idea of hazard involved. The value of elimination is thus referred directly to a measurable economic loss.

Under his second heading, Mr. James in his paper asserts that "having made such a classification, based largely on highway traffic density, we should be in a position to arrange each year for a reasonable program of grade-crossing elimination. It might not be possible to include each crossing in its exact order, but the relative importance of elimination would be known and the program would be defensible."

Grade Crossings Increasing

Despite the growing program of elimination, the number of grade crossings is actually increasing. There were 232,710 such crossings in 1924, according to Mr. James' figures; 233,701; in 1925, 235,158 in 1926, and 235,446 in 1927. At present, he declares, the authority to create new grade crossings lies usually with the administrative body authorized to open or to accept newly opened roads. Such authority, in his opinion, should be confined to the state highway department, or to some state public utility commission, and new crossings should be permitted only where the need is demonstrated as sufficiently great, and where no other route or solution is possible at the time.

The plans for the several safety devices for grade crossings should be uniform for all highways and all railroads, Mr. James contends. They may be gates with or without watchmen, watchmen alone, lights, wigwag signals, gongs or other apparatus; but in each case, the installation and operation should be as nearly uniform as possible. Which method of protection is the most effective can probably be determined if the highway authorities will undertake the necessary studies required, and if some form or forms of protection are fixed as most likely to prevent accidents, Mr. James believes.

The Economic Consideration

"Finally, some more or less definite readjustment of costs between the railroads and the public should be made for all grade-crossing treatments. At the present time, the cost of installing protective features is borne by the states entirely in some cases, in others, entirely by the railroads. If we are to base a program of elimination on a classification based on economic saving to highway traffic, it appears logical and fair to be liberal in the allotment of costs to the general public.

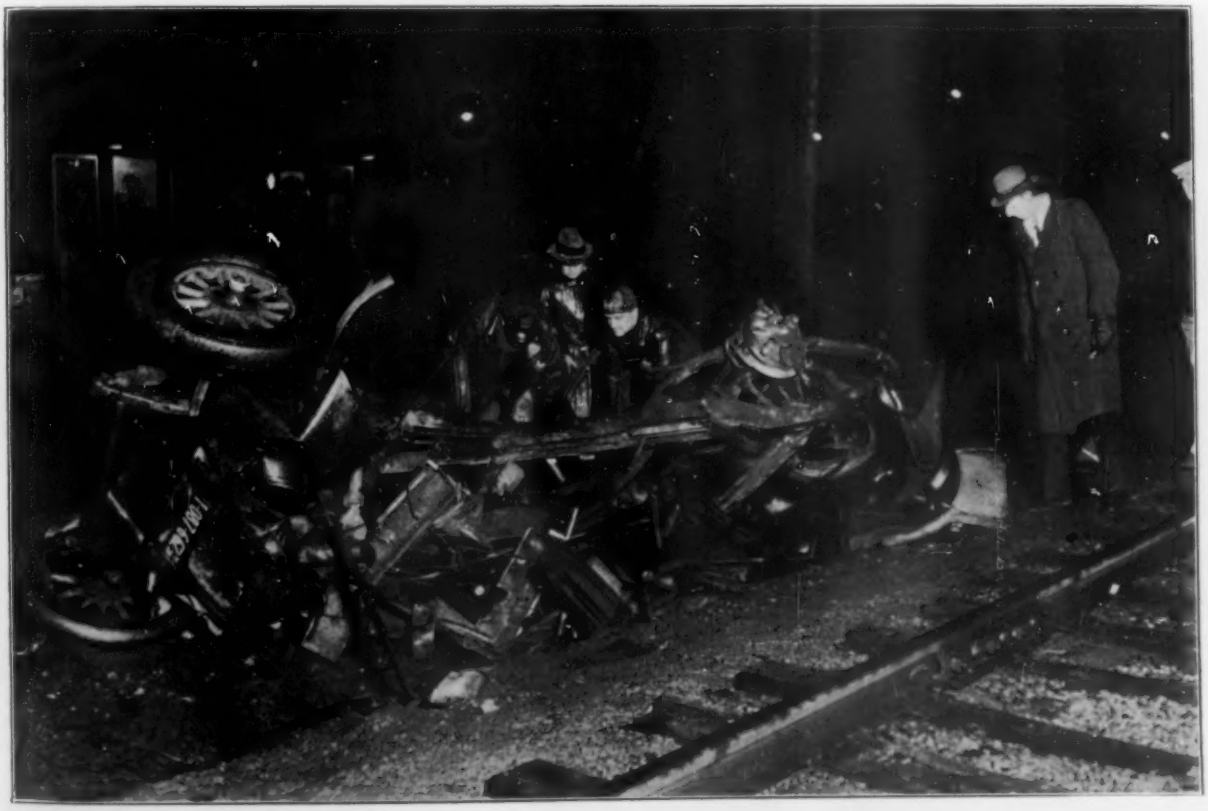
"It is recommended that each state highway department undertake, through a designated official, to collect accident figures and analyze them in form to show the urban and rural crossings, accidents at each and resulting fatalities; the types of protected crossings, their location, and accidents and results at each. This information will permit setting up separate urban and suburban programs, and enable a decision to be made as to the effectiveness of the several types of protection where immediate elimination is not possible. . . .

"To summarize the thought presented in this report, it should be noted that the evaluation of intangibles is neglected and a method suggested that permits of an exact determination of economic losses measurable by stop-watch methods. Any reasonable valuation can be assigned, and so long as it is the same it serves to fix the classification of the grade crossings and eliminates relative error in such classification. Then, by assigning the actual value of delays, which, if necessary, may be assumed to be different in different places, the cost of actual elimination may be justified in cases where the economic loss is sufficiently great. The element of human life and the damage to property is not actually neglected, for their protection will flow as a by-product from the eliminations made, and in as great a degree as can be determined by any less exact or rational method of selecting grade crossings for elimination."

THE SAME DAY BROUGHT THESE GRADE-CROSSING SMASH-UPS IN WIDELY SEPARATED STATES

The upper view shows the result of a race across the crossing, at Lawrence, Long Island, N. Y. The driver lost the race but saved his life by jumping, the truck being thrown against the crossing gate

The lower photograph shows what was left of an automobile that was struck at a grade crossing in Oak Park, Ill. Two men, two women and two children were killed and another child was seriously hurt. A fine mist obscured the vision of the driver and the locomotive engineer



P. & A. Photos

System and Uniformity in Assessment Methods as Legal Requirements

A Bill Drafted for the Consideration of the Pennsylvania Legislature Prescribes a Cure for Certain Deep-seated Tax Valuation Ills

AS a result of an investigation into methods used and results obtained in the valuation of real estate for the purpose of taxation, a bill has been drafted for presentation to the Pennsylvania Legislature, prescribing that tax valuations, or assessments, shall be made in a uniform and systematic manner, and laying down certain fundamental requirements to this end, including adequate tax maps.

The investigation was made under the auspices of the North Philadelphia Realty Board and the City Club of Philadelphia, for the purpose of comparing results arrived at by scientific appraisal methods with the assessments actually in effect, numerous complaints of inequity in the latter having been made from year to year. Fourteen entire Philadelphia blocks, scattered throughout the city and representing a variety of conditions, were studied, and the results are to be presented in pamphlet form. One of the recommendations made, in view of inequitable assessments and unsystematic methods revealed, and of the local political situation, was that efforts be made to bring about the enactment of a law establishing sound and accurate appraisal standards throughout the state. The full text of the law, as furnished by Walter W. Pollock, President of the Manufacturers' Appraisal Co., of Philadelphia, which made the investigation with the collaboration of members of the two sponsoring organizations, is given below.

One requirement of the proposed bill is that land and buildings shall be separately appraised; and it is provided that machinery and furnishings, other than for the service of the buildings, shall not be assessed as part of the real estate. As a matter of fact, machinery is not taxed at all in Philadelphia, nor in Pittsburgh or Scranton, the two second-class cities in Pennsylvania; in other localities of that state it is nominally taxable, although frequently not actually levied upon.

Municipalities Need Not Wait for the Compulsion of Law to Adopt Scientific Assessment Methods

The proposed law, here quoted, would make mandatory the policy of uniform and systematic assessment procedure, and certain specific aids to the accomplishment of this policy, which are generally within the power of cities in any state to adopt, wherever the local officials are sufficiently informed as to modern tax-valuation methods and have the wish to put such a policy into effect. The evils of inequitable assessments are so well known that it is almost unnecessary to emphasize the desirability of some system that will minimize such results. Special care is of course necessary when an unsatisfactory system, or lack of system, is to be superseded by modern, scientific methods; and it is well at such a time that expert aid be invoked—not only because of a need of special knowledge when putting such an important matter of policy and procedure into operation, but also on account of the detachment and impartiality that are more easily maintained by outside professional assistance.

AN ACT REGULATING THE APPRAISAL OF REAL ESTATE FOR PURPOSES OF TAXATION

Be it enacted by the Senate and House of Representatives of The Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted, that all real estate assessors in the Commonwealth of Pennsylvania shall make and record assessments of real estate in such manner as to show separate valuations of land and of buildings or other improvements thereon, for each lot or parcel of land. The records of assessments shall be open for public inspection during all regular office hours.

The said real estate assessors shall make their assessments in a uniform and systematic manner, and to that end shall, in addition to all present requirements of law:

(a) Prepare or cause to be prepared lot and block maps showing block boundaries and dimensions of lots and parcels of land in each block, with systematic numbering of lots and blocks for identification and appraisal purposes.

(b) Prepare or cause to be prepared maps of areas under their respective assessment jurisdictions in convenient geographical sections, showing streets, highways and other public thoroughfares, to be known as unit-valuation maps.

(c) The assessors shall mark upon unit-valuation maps their tentative appraisal of street frontage valuations within cities, boroughs, villages and other urban and suburban centers of population where land is platted into lots or parcels for residential, commercial, educational, industrial or other community purposes, with reference to a uniform unit of quantity, which shall be known as the "unit-foot." The unit-foot, when so appraised by the assessors, shall represent their opinion as to the valuation which a single street reflects to the land fronting thereon for one foot front, 100 feet deep, or for some other appropriate uniform depth. Before determination of final unit-foot valuations for assessment purposes, the assessors shall invite review by taxpayers of the tentative unit-foot valuations at public hearing or by other adequate methods. After determination of final unit-foot valuations, the assessors shall, by uniform methods, in consideration of location and utility of land, compute the enhancing effects upon each lot or parcel of land, which may be due to depth, frontage, corner, alley, railway, waterway or other enhancing influences. The assessors, after computing the valuation of each individual lot or parcel in the manner described, shall consider whether the valuation thus determined shall be modified because of unusual or special influences peculiar to any lots or parcels, which may render the valuation of such lots or parcels not computable by uniform rule. The computation record shall show for each lot or parcel the street unit-foot valuation or valuations, the computations based thereon, and also the items of special addition or deduction, if any, for special enhancing or detracting influences, with the reasons therefor.

(d) The assessors may express their judgment of land valuation in terms of the acre unit for tracts of land where the acre unit is, in their opinion, appropriate, or in terms of the square-foot unit for tracts of land where the square-foot unit is, in their opinion, appropriate.

(e) The assessors shall measure and describe buildings and other improvements upon land; they shall determine and record the unit cost and depreciation factors as of the legal assessment date, and shall record the data essential to the specific appraisal of buildings and other improvements on land. In the appraisal of buildings for assessment, the assessors shall consider as part of buildings, in addition to structures, the heating, lighting, plumbing and other attached fixtures, sprinkler equipment, power-plants, passenger and

freight elevators, and other items required to serve the use of buildings as such; but mechanical equipment and furnishings not required in the service of buildings, and in fact required for manufacturing, commercial and other purposes aside from the operation of buildings, shall not be considered as pertaining to buildings or real estate for assessment purposes.

(f) Wherever used in this act:

"Assessment" shall be construed to mean the valuation for purposes of taxation.

"Appraisal" shall be construed to mean the process of determining valuation.

"Valuation" shall be construed to mean and to relate to the fair selling price of land, buildings and other improvements upon lots or parcels of real estate "if sold singly and separately at a bona fide sale, after full public notice."

"Unit cost" as applied to the appraisal of buildings shall be construed to mean the money cost of reproduction as of a specific date, per square foot of floor space, per cubic foot of content, or of any other adequate quantity unit.

"Depreciation" shall be construed to mean the assessors' opinion as to loss in valuation of buildings or other improvements on land, due to mechanical deterioration, obsolescence, lack of utility, or other causes.

The Government of the District of Columbia

By DANIEL E. GARGES

SECRETARY, BOARD OF COMMISSIONERS, D. C.

SECTION 8, Article I, of the Constitution of the United States provides that Congress shall exercise exclusive legislation over such district (not exceeding 10 miles square) as may, by cession of particular states, and the acceptance of Congress, become the seat of the Government of the United States.

The states of Maryland and Virginia made the cession contemplated by this clause in the year 1788, and it was accepted by Congress. The original District of Columbia was 10 miles square, lying on either side of the Potomac River at the head of navigation. Later, Congress retroceded to Virginia that portion of the District of Columbia lying in that state. The District now contains 70 square miles on the Maryland side of the Potomac River.

When the District of Columbia was selected as the capital, the land therein was owned by a number of people, and they deeded their land to two trustees to lay out the streets, avenues, and public squares, and divided the rest of the land into blocks and lots. The land consisted of about 6,000 acres. In laying out the streets, 3,606 acres were taken, and about 540 acres were bought by the United States as sites for the public buildings and grounds. The lots laid out numbered 20,272. Of these, the United States took half, and the property owners were given back the remainder. The United States sold its share of the lots and from the proceeds paid for the 540 acres on which it was to put the public buildings. The United States also took a fee simple title to the streets and avenues. The city was laid out by Major L'Enfant, a French engineer.

The Governmental Beginnings

The first government of the city of Washington consisted of a mayor appointed by the President of the United States and a city council elected by the people of the city. This was the year 1802. Later in the year 1812, the city council was permitted to elect the mayor. This continued until the year 1820, when the people were permitted to elect the mayor. This mayor was elected for a term of two years, and this form of government continued until the year 1871.

By an Act of Congress of February 21, 1871, a territorial form of government was provided for, consisting of a governor, a board of public works, and a legislative assembly. The legislative assembly consisted of eleven members called a council, and twenty-two members called a house of delegates. The District also then had a delegate in the House of Representatives of the United States.

The governor and board of public works were appointed by the President of the United States, and the legislative assembly was elected by the people.

This form of government lasted three years, until June 20, 1874, when Congress provided that the District should be governed by three commissioners appointed by the President. This was known as the temporary form of government and lasted until July 1, 1878, when the present form of government was adopted.

Acting under the authority of the Constitution, the Congress by an Act approved June 11, 1878, created the present form of government of the District of Columbia. By this act the District was created a municipal corporation with right to sue and be sued.

The Act provided for the appointment of three commissioners, two of them to be selected by the President from persons residing in the District of Columbia for a period of three years preceding their appointment. The third member was to be an officer of the Engineer Corps, U. S. Army, detailed by the President, known as the Engineer Commissioner. The appointments of the civilian commissioners are for a period of three years or until their successors are appointed. The detail of the Engineer Commissioner is at the pleasure of the President. This detail is usually about four years.

While the District has a municipal form of government, Congress, by various statutory enactments, has treated it as a branch of the U. S. Government, by including it in legislation applying to the executive departments, such as the Budget and Accounting Act, the Act Classifying the Salaries of Federal Employees, and the Act Providing for Retirement of Federal Employees.

Method of Financing

In the Act of June 11, 1878, it was provided that the expenses of the government of the District of Columbia should be borne, 50 per cent by the U. S. Government and 50 per cent from revenues of the District of Columbia, raised by taxation. This method of financing remained in force from 1878 until 1920. In that year the proportionate expense was changed by Congress so that 60 per cent of the expenditures was raised by taxation and 40 per cent was contributed by the Federal Government. This provision continued in force until the year 1925, when Congress determined on a lump sum contribution by the United States of $9,000,000 annually, the balance of the expenses to be raised by taxation.

During the present year the contribution by the United States equals about 25 per cent of the total expenses.

For the efficient handling of the business of the District Government, the various municipal functions are divided among the commissioners as committees of one. The present members of the Board of Commissioners are Proctor L. Dougherty, Sidney F. Taliaferro and W. B. Ladue.

Division of Municipal Functions

Commissioner Dougherty has assigned to him the Police, Fire and Health Departments, Director of Traffic, License Bureau, Free Public Library, Coroner's Office, Office of Veterinary and Office of the Superintendent of Weights, Measures and Markets.

Commissioner Taliaferro has charge of the legal and financial branches such as the Corporation Counsel's Office, Auditor, Assessor, Purchasing Officer, Collector of Taxes, Board of Accountancy, Insurance Department, Playground Department and the Board of Public Welfare.

All construction work is under the supervision of the Engineer Commissioner, Colonel Ladue. He has charge of the Municipal Architect's Office, Sur-

veyor, Water Department, Electrical Department, Surface Division, Trees and Parking Division, Sewer Division, City Refuse Division, Building Inspection Division and Plumbing Inspection Division.

The heads of the various departments make recommendations to the Commissioners in charge of their respective departments, and each Commissioner brings these recommendations to meetings of the Board of Commissioners, which are held on Tuesdays and Fridays of each week. The Secretary to the Board of Commissioners records the action on these recommendations and acts as executive officer of the Board by issuing orders and carrying on correspondence.

Not all of the municipal duties are, however, vested in the Board of Commissioners. The management of the public schools is vested in a School Board of nine members appointed by the Justices of the Supreme Court, D. C. The Public Library, with its branches, is managed by a Board of Trustees appointed by the Board of Commissioners. The penal, charitable and correctional institutions are managed by a Board of Public Welfare appointed by the Commissioners. The public utilities are under a Public Utilities Commission consisting of two civilians appointed by the President, and the Engineer Commissioner, who is a member ex-officio. The public parks are under the jurisdiction of an Army engineer officer, who is in charge of public buildings and grounds. The water-supply is under another Army engineer officer designated as District Engineer, but the distribution of the water is under the jurisdiction of the Commissioners. The zoning of private property as to height of building, use of building, area of ground to be built upon, is handled by a Zoning Commission, of which the three District Commissioners are members, and in addition thereto the Architect of the Capital, and the officer in charge of public buildings and public parks. The judges of the Supreme Court of the District of Columbia and of the Police, Municipal and Juvenile Courts are appointed by the President of the United States, as is also the Recorder of Deeds of the District.

To advise the Commissioners as to the planning of the city in laying out new and changing old highways, there has been created by Congress a National Capital Park and Planning Commission. This Commission purchases all land for parks and playgrounds. The land so purchased for parks is placed under the officer in charge of public buildings and public parks, and the land for playgrounds under the Commissioners.

Appropriations and Taxation

All expenditures for municipal purposes, including the schools, parks, water-supply, land purchases, etc., are appropriated for by Congress annually, based upon estimates submitted by the heads of the District Government and the other officials hereinbefore named.

These estimates are submitted by the Commissioners to the Director of the Budget, a Federal official, and when approved are submitted by the President to Congress, together with the estimates of the Federal Government. Before submitting such estimates the Commissioners fix upon a tax rate which they believe should not be exceeded. This tax rate is such that when applied to the taxable value of a real, personal and intangible property in the District of Columbia, will raise the funds necessary to meet the estimates of the appropriations submitted to the Director of the Budget. The present rate of taxation for real and personal property is $1.70 per $100, based on full value. For intangible personal property, such as money in bank, stock and bonds, etc., the rate is ½ of 1 per cent.

For the fiscal year ended June 30, 1928, the assessed value of land in the District of Columbia was $531,211,850, and of improvements $606,846,055, a total of $1,138,057,905. The assessed value of tangible personal property for the year was $105,653,152. The value of intangible personal property for the same year was $495,908,396.

The value of public lands and buildings in the District not subject to taxation is approximately as follows:

Government of the United States	$470,000,000
Government of the District of Columbia	50,000,000
Churches, schools, legations, hospitals, and eleemosynary institutions	75,000,000

The budget estimates as submitted by the President to Congress must be reviewed by subcommittees of the Appropriations Committees of the House and Senate, and the total amount of the appropriations fixed by Congress and approved by the President.

All legislation affecting the District of Columbia must be passed by Congress under the provisions of the Constitution. The advice of the Commissioners is usually asked before such legislation is enacted.

What I have stated is but a brief outline of the government of the District of Columbia. You will see that the District has a dual status as a municipal corporation and as a branch of the Federal Government. This situation has no parallel in any other city of the United States. The District is also unique in having no bonded debt. All of its expenses are borne from current revenues.

The residents of the District of Columbia do not enjoy the privilege or obligation of suffrage. On the question of whether the people should be allowed to vote in national elections and in local elections, there is a division of opinion. In order to grant them the franchise, an amendment to the Constitution of the United States will have to be adopted. Legislation covering this matter is pending before Congress.

Collection of Delinquent Taxes by Municipalities

THE collection of delinquent taxes is often neglected by city officials, resulting in a considerable financial loss to the municipality. A study of the charter provisions of New York State cities relating to the collection of delinquent taxes was recently made by the State Bureau of Municipal Information. This study shows that the method of procedure is to enforce the payment of delinquent taxes either by selling the property or by selling a tax lien.

The sale of property for taxes usually takes place from one to three years after the taxes have become due and after the publication of a tax sale notice for from three to six weeks. The property is sold at auction to the highest bidder, provided that the bid covers the amount of taxes, all unpaid assessments, interest, fees, penalties, and other charges against the property. If the bid is not sufficient to cover these items, the city bids in the property. Property sold for taxes may be redeemed after a period varying from one to three years upon payment of sum sold for, together with interest computed at the rate of 12 per cent per annum. If the property is not redeemed within the prescribed time the purchaser is given either a deed, an estate in fee simple, or an absolute estate in fee, subject only to the lien of unpaid state and county taxes.

In two cities, White Plains and Yonkers, the tax lien is sold. This has worked out very satisfactorily. In Yonkers the problem of the collection of delinquent taxes has been cleared up:

1. By keeping the assessed valuation down to the real present market value, thereby preventing the accumulation of a large amount of uncollectible taxes.
2. By foreclosure, in one action, of large numbers of lots in one ownership.
3. By assignment of tax liens, at full value, to any one applying for same.
4. By re-sale, at reduced amounts, of tax liens held by the city.
5. By compromise with owners, reducing the amounts due to a sum that will make it worth while for such owners to pay up, the city thereby saving foreclosure costs, and immediately placing such property on a tax-paying basis, and at the same time allowing the owners to get out with some equity. Foreclosure should never be resorted to where an owner shows any disposition to compromise.

Relaying Old Brick Pavements in Jacksonville

By W. E. SHEDDAN
CITY ENGINEER, JACKSONVILLE, FLA.

THE practice of laying vitrified brick pavements on natural subgrade with sand filler and without special foundation was followed quite generally in Jacksonville, and to a considerable extent is still followed in some locations. Most of the local brick pavements were constructed from fifteen to thirty years ago and have served to carry traffic far in excess of that for which they were designed. With modern traffic and the motoring public demanding smooth-riding pavements, city officials are faced with the need for rebuilding these streets and thoroughfares. Our study of this problem leads us to two definite conclusions:

1. Most of these pavements were not of sufficient width to meet modern traffic requirements
2. The old brick had a definite salvage value, and our examination of them indicated to us that there were from 60 to 85 per cent of them usable

The city of Jacksonville had some fifty or more miles of these pavements. It was recommended that certain streets be rebuilt with wider roadways. Forty-, fifty- and sixty-foot widths were selected, which conform to more or less standard widths used in Jacksonville. This program is now being completed and it has been found that the salvage quantities of the brick had been somewhat underestimated.

Large Proportion of Brick Salvaged from Streets

Certain limited areas which were constructed thirty or more years ago of small-size brick which were not figured of value in the relay program actually produced more than 50 per cent reasonably good brick. These brick are usable for repair purposes and could be relaid on foundation for light-traffic streets.

Other streets that have had from 18 to 25 years' service produced salvage quantities of usable brick averaging 75 per cent, and on some streets the salvage quantities exceeded 85 per cent. All these were "repress" brick approximately 3 x 4 x 8 inches in size which were originally laid on edge but in the relay program were relaid flat. They cost when purchased from $21 to $24 per thousand, delivered in Jacksonville, and the cost in place was from $1.25 to $1.60 per square yard, which is approximately 60 per cent of the present prevailing price.

Extent of Relay Program

The relay program comprises approximately 55,000 yards, or about 2½ miles of 40-foot roadway, and all were relaid on 8-inch compacted Florida limerock base with sand cushion and standard bituminous filler. The old granite curbs were reset, except that new 20-foot radii were used.

Two Sessions on Brick Paving

At the Twenty-third Annual Meeting of the National Paving Brick Manufacturers Association, two sessions were open to engineers, city officials and contractors and were devoted to the technical aspects of paving streets and highways with vitrified brick. The papers covered the value of subgrade investigations of the U. S. Bureau of Public Roads, fillers for brick pavements as shown by experience of Ohio State highways, the design of concrete bases for vitrified brick pavements, a paper which provoked spirited discussion, flexible bases for vitrified brick pavements, and a verbal report on general paving conditions. The meeting closed with an inspection of the Chevy Chase-Connecticut Avenue Experimental Road of the U. S. Bureau of Public Roads. The road is reputed to be the oldest experimental highway in existence on which accurate, continuous maintenance records have been kept.

When this work was advertised, the city was fortunate in getting a large list of responsible contractors to bid. The bids were close and low. The prices bid by the three lower bidders for relaying with standard brick filler on limerock base were from 30c to 45c per square yard. The prices bid for base, which included grading and adjustments, were from $1.06 to $1.29, and resetting of old granite curb from 11c to 13c. The prices bid for new brick, 3-inch vertical fiber with bituminous filler, were from $1.62 to $1.93, with about the same range for base and curb.

The relay projects have more than fulfilled expectations as to smoothness and general appearance.

Bituminous Filter

The bituminous filler was applied in the ordinary way. One contractor used pouring cans, heating his bitumen in ordinary 500-gallon kettles; another used the ordinary 500-gallon kettles for heating, the bitumen being distributed direct from the kettles by attaching a hose and letting it drag on the brick and spill out, pulling the kettles with a roller. Both used hot metal squeegees for spreading and cutting the bitumen on the brick surface.

The relay brick required an average of 13½ pounds of bitumen per square yard and the new brick an average of 11½ pounds per square yard.

Costs

We figure that the over-all average cost per square yard of completed pavements on the seven relay projects was $2.44, and the over-all average cost per square yard for completed pavements on the new brick projects was $3.05, showing a difference of $0.61 per square yard, which is a saving of $33,550 to property owners and the city on the seven projects.

The cost shown for new brick is the cost after the salvage value of the old brick taken from these streets has been deducted. This salvage actually amounts to an average of 33 cents per square yard, which would make the cost of new brick based on these bids $3.38 per square yard. This shows that the savings are about equally divided between the streets from which the brick were taken and the streets on which they were used.

In figuring the cost of the relay brick, the value of the brick already on these streets and used in the relay was not shown, only the brick added to fill out added width were charged.

Saving was effected not only on the relay streets, but also on the streets from which the brick were taken up and replaced with new materials. We credited to the streets from which they were moved, all usable brick at $20 per thousand; this effected from 85 cents to $1 per front-foot saving on these streets. The work was all done on a one-third-two-third plan, the city paying from bond issue funds, one-third the total cost and assessing two-thirds

of the total cost to abutting property on a per-front-foot basis.

Duval County has utilized this plan in rebuilding county highways, having relaid approximately 30 miles of 16-foot road on a somewhat similar specification, with about the same results.

Articles on economic comparisons of various types of road surfacing, Milwaukee's municipal quarry and street widths in cities over 150,000 in the United States are among the valuable material to be in the April issue of THE AMERICAN CITY.

NEW BRICK—EIGHT (8) PROJECTS

	Width Ft.	Sq. Yd.	Cost per Sq. Yd.	Total Cost
ADAMS ST.—Main to Newman	40	3,813.8	$2.9104279	$11,099.79
ADAMS ST.—Newman to Washington	36	5,243	2.9672211	15,557.14
CHURCH ST.—Main to Ocean	40	1,885.2	3.212949	6,057.06
DUVAL ST.—Main to Market	40	5,596.7	3.1113425	17,319.91
DUVAL ST.—Market to Viaduct	40	4,950.1	2.8771681	14,242.27
MONROE ST.—Main to Newman	40	3,732.6	2.981863	11,055.45
MYRTLE AVE.—Dennis to Forest	40	7,070	3.25	23,221.65
OCEAN ST.—Forsyth to Orange	40	10,231.2	3.0388868	21,101.69
TOTAL		42,492.60		$129,654.94
Average			$3.0512357	

RELAY BRICK—SEVEN (7) PROJECTS

ASHLEY ST.—Broad to Davis	40	5,761.7	$2.53122	$14,584.13
DAVIS ST.—Adams to Ashley	30	3,474.1	2.4134452	8,384.55
DUVAL ST.—Palmetto to Georgia	40	7,079.2	2.453571	17,369.32
DUVAL ST.—Georgia to Talleyrand	40	14,982.8	2.2511346	33,728.30
MARKET ST.—Church to Orange	40	6,629.4	2.3536655	15,603.39
MYRTLE AVE.—Bay to Beaver	38	10,773	2.62	28,225.21
MYRTLE AVE.—Beaver to Kings Road	38	6,226	2.62	16,283.05
TOTAL		54,926.20		$134,177.95
AVERAGE			$2.4428770	
DIFFERENCE			$.6083587	
SAVING				$33,414.83

The Place of the Garage in City Planning

By ERNEST P. GOODRICH
CONSULTING ENGINEER, NEW YORK

THE place of the garage in city planning is one of the most troublesome of all planning problems. Recent tendencies in well-considered zoning ordinances, however, point to the prospect of a satisfactory solution.

In zoning work, garages may be divided into four classes: (1) private garages for the use of one or more families living on the same lot upon which the garage is built; (2) parking garages within an office building for the use of tenants or their clients; (3) public garages whose main function is parking of cars for tenants or clients of near-by buildings; and (4) so-called public garages devoted primarily to the repair of motor vehicles.

The recent trend in zoning ordinances has been to exclude from business districts garages devoted primarily to repair and to permit them only in zones of light or heavy industries. Although some zoning ordinances prohibit private or public parking garages in business districts, it would be better to encourage their proper location and use in districts where traffic density and street width necessitate entire prohibition of parking.

In single-family residence districts there is a tendency to have the garage located within the walls of the main building, either at ground level, below building grade or as a projecting wing of the building, instead of on the rear corner of the lot, as was the prevailing custom up to the last few years. In two-family houses and for dwellings there is a similar tendency to keep the back yards open by placing a garage within or adjacent to the residence structure. This has resulted from a demand for heated garages, but the by-product of greater yard openness is no less important as a social factor.

With respect to the garages incident to apartment houses a more serious problem and a wide difference of opinion exist. Serious opposition develops whenever it is proposed that garage space be provided underneath multi-family dwellings. The imperative need to provide suitable garage space limited to storage of private passenger cars for tenants of such multi-family apartment structures leaves only one course open, namely: to provide such space on the same lot with multi-family structures. Where the slope of the ground permits, this can be accomplished by construction of storage garages, one-half the height of which is under ground. The problem of draining away gasoline and oil vapors makes it necessary to slope the garage floor and place the exits so that there shall be proper drainage of air to lessen the explosion and asphyxiation hazard. In flat country this hazard necessitates the construction of the garage entirely above the ground. Where the roof of such a garage is flat and terraced or surfaced so as to provide a recreation or parking area, it seems proper to count such surface area as part of the side or rear yard.

Incidentally, one of the most recent zoning ordinances provides that on the same lot as any apartment house there shall be a paved or graveled parking space of sufficient area to accommodate one car for each family housed, and that such parking area shall not be leased but reserved for the tenants of the apartment house and their guests.

Of course, it goes without saying that all public garages and all private garages incident to multi-family dwellings should be capable of meeting the Board of Fire Underwriters' standard one hour fire test. Also that one- or two-car garages in connection with private homes, two-family or group houses should be of fire-resistant construction when within the walls or adjacent to the house.

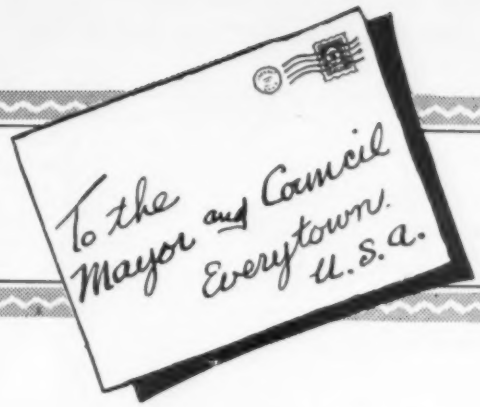
Owners of office buildings in our large cities now realize that the provision of garage parking space attached to or within the building for the use of tenants and their clients is an important inducement in renting. (Provision of such parking space may not be essential if the office building is close to an efficient public parking garage, but as these are often overloaded, it is probably the better policy to provide garage parking space in connection with all buildings.) This garage space may be provided partly under ground and partly in the rear, or the entire central dark portion of the building may be utilized for parking purposes.

Entrance and exit from these parking garages should be placed as far as possible from street intersections in order that cars waiting for the traffic signal will not block cars coming from the garage.

The foregoing observations represent the general trend, which appears to be a sound one. Though a long way from being generally adopted, these tendencies provide a fairly satisfactory answer to the question of where garages should be located in city planning schemes.

Reprinted, by permission, from the February number of The Architectural Record, which also carries a 20-page illustrated article on "Garages," featuring especially standards for design and construction of recent types of parking garages.

A MONTHLY OPEN LETTER



March 1, 1929

Honorable Sirs:

CITY government is not a business. The business of business is the making of profits. The business of government is the performance of service for its citizens. But, business profits are generally dependent on keeping down costs. In the service of government there is abundant reason, also, for keeping down costs. There is thus a wide field of city work where ordinary business principles are applicable.

All of which simply means that though city government is not a business, there is plenty of reason for its being businesslike.

One simple subject on which city governments could learn a lot from business practice is the matter of purchasing methods. City purchasing has in the past been slipshod and unsystematic, lacking in foresight and coordination and, in some instances, tainted with venality. Within the last two decades there has been a vast improvement in this field. Perhaps you have been in the van of this effort, but one must keep in continuous touch with what is going on, for the improvements are numerous and far-reaching.

There is nothing technical about the principles underlying a sound purchasing system. They are the very same that you apply in your daily affairs. Suppose you wanted to have a room in your home redecorated. You would not call in the first painter who passed and tell him to start work. You would first make up your mind as to what you wanted. This you would communicate to several prospective craftsmen. In other words, you would send them your *specifications* and ask them to submit their *bids*. The more experience you have had, the more precise your specifications would be. The more definite you make them, the easier will it be for bidders to know what they are asked to do, and in this way alone can you get estimates that are at all comparable. The Mrs. does the same, less formally, when buying vegetables or linens.

For ordering supplies for a city, the rules are just about what common sense will tell you they ought to be.

1. Your first need is to *know* what you want. How else can you ever hope to get it? The job of preparing specifications is a technical one. This requires consultation between the buying officer and the using officer. You can also avail yourself of the experience available from such sources as the United States Bureau of Standards, the American Standards Association, the Navy Department, and the New York City Department of Purchase. These will gladly send you copies of their standards and specifications. Like them, you will be constantly wanting to revise them to suit local needs or local experience. With specifications comes standardization or the reduction of the variety of commodities used. Only in this way can bulk orders with the economies resulting therefrom be obtained, and only in this way can it be made possible to shift supplies from department to department in the event of surplus or emergency.

2. Invitations for bids should be simple and definite. If standard specifications are referred to, there should be a note to tell where these can be seen or obtained.

3. A series of carefully classified lists of dealers should be kept arranged by commodities, and invitations should be sent to all dealers on these various lists. The existence of this system should be given wide publicity, and dealers should be urged to ask to have their names entered under the appropriate heading. The old-fashioned way was to depend wholly on proposal advertisements in newspapers where few would see them. This was expensive and ineffective—almost completely futile—and it failed even to eliminate collusion, because an "insider" could still "tip off" a friend.

4. Bids should be received only in sealed envelopes and they should be opened at a stated time by the purchasing officer or his deputy. As soon as possible these bids should be assembled and posted, together with a copy of the order to the successful bidder. There is nothing more useful than a sizable bulletin board on which can be posted all outstanding invitations, notices of current openings and recent awards.

5. Lastly, see if your city's bills can't be paid more promptly. It isn't a question of credit, it is a matter of annoyance and discouragement to conscientious and conservative business men. Don't blame it all on red tape. There must be red tape. All big businesses have plenty of it. It is not the routine which is at fault; it's carelessness and a lack of appreciation of the importance of prompt payment in modern business.

THESE are perhaps the most important features of a purchasing system. There are other items such as the organization of the purchasing office, its status in charter or ordinance, the matter of testing samples and deliveries, and other things that you can readily learn about.* Be careful to make everybody come in. Hospital units and libraries will plead the professional character of their needs. True, but exemptions should be on the basis of class of commodity and should not extend, for example, to gasoline, or stationery bought by these units.

The advantages of such a system in economy must be obvious. But even if you could not effect a tax cut or a tax rebate that would take the poor taxpayer's breath away, you could find money to do a lot of the little things which you have been wanting to do and which will earn you his gratitude almost as surely.

* An excellent brief article on "The Essentials of a City Purchasing System" by Russell Forbes, of the Municipal Administration Service, can be found in the *Purchasing Agent*, November, 1928. A book on *Purchasing Methods* by the same author is being published by Harper & Brothers this Spring.

BUT there is one big thing which all technical discussions of improved purchasing methods overlook. It is a chance to win the good opinion of the business men of your community. You will concede that there is no group whose good opinion you would value more highly. No group has a larger share in the formation of public opinion in general on the quality of your administration. You will concede also that business men hold the business methods of government in more or less good-natured contempt. We won't go into that—but you can readily appreciate how much better an opinion your local business community will have of their government if they find it commands respect in their dealings with it. People form impressions on little things. The better your system, the more business men in your city will want the city for a customer. The more business men who have a first-hand contact with your city government, the more friends you should have among opinion-making people.

Yours cooperatively,

HINTSAND POINTERS.

Penny-a-Day Banks Helped to Obtain the Hollywood Bowl

By MADELINE McCLINTOCK

AUDIENCES of 10,000 to 20,000 are expected again this year to enjoy the "Symphonies under the Stars" in the Hollywood Bowl, at Hollywood, Calif. The musical offerings of the eight-weeks season, as usual, will include soloists of world renown, and novelty features, in addition to the orchestral concerts, for all of which there will be eminent guest conductors.

The "Symphonies Under the Stars" represent a remarkable example of music of the highest order, democratized and placed within the financial reach of everybody; music in a superb setting. The Hollywood Bowl is a huge canyon, with a level floor of about 5 acres in the lovely Hollywood hills. On two sides, these hills rise to a height of 500 feet—a magnificent black "set" against the star-splattered blue "backdrop" of night. On the third side, several canyons with smaller level floors extend back into the hills. On the fourth side, there is a narrow bottle-necked flat space which now forms a roadway to El Camino Real (the King's Highway), the principal thoroughfare from Los Angeles to the San Fernandino valley and points to the north. This matchless outdoor theater has been insured for public uses for all times through the action of the Hollywood Bowl Association, which, some time after buying the property, conveyed it to the county of Los Angeles. The county in turn issued a 99-year lease with renewal privileges for an additional 99 years in favor of the Association.

The inception of the plan is interesting. Eight years ago, the Theater Arts Alliance was formed, when a group of civic-minded people interested in the cultural progress of their community came together, saw the possibilities of the natural amphitheater, and bought the site of 59 acres for $65,000. They could pay only $5,500 cash, but they started out at once to obtain money to pay off the indebtedness.

"Penny-a-Day" banks were circulated among residents of Los Angeles and Hollywood, and through these banks, by the hoarding of pennies, nickels, and dimes, hosts of friends—children as well as adults—donated several thousand dollars. Other subscriptions were made in sufficient amounts to make additional payments on the property and to erect temporary wooden benches and a stage.

Easter sunrise services were inaugurated in 1922, when the Los Angeles Philharmonic Orchestra of 100 pieces demonstrated the great effectiveness and beauty of music and mass worship out of doors. These annual services have become an integral part of the community life of Southern California, and are attended by people from all parts of the Southland, many of whom travel all night in order to be present when the first low notes of music are wafted upwards on Easter morning.

During the summer, of that same year, 1922, enthusiasm for outdoor music spread throughout Southern California, with the result that "Symphonies Under the Stars" were inaugurated. Audiences of 5,000 to 15,000 attended these concerts, which were under the direction of Alfred Hertz, internationally known orchestra leader. In order to make it possible for everyone to attend, the season books containing 40 tickets were sold for $10 which meant only 25 cents per ticket. Single admissions were placed at 50 cents. Since the majority of concert-goers purchase season tickets, Hollywood has become known as the producer of "two-bit" symphonies.

THE BOWL AT HOLLYWOOD, CALIF., ON THE NIGHT OF A CONCERT

During the spring of 1926, over $200,000 was spent on the site. Permanent seats—20,000 of them—are now in place, and the whole million-dollar building program which is now under way, and which will transform the canyon into a charmingly landscaped garden theater, is expected to be completed within five years.

An eight-weeks season has been held each summer since the programs were inaugurated. Galli-Curci, Rosa Ponselle, Louis Graveure, Alice Gentle, Ossip Gabrilowitsch, Cadman, Tibbett, Mischa Elman, and Madam Schumann-Heink are among the soloists who have been employed. More than a dozen eminent orchestra leaders have been guest conductors, directing the 100-piece orchestra in the presentation of the great musical masterpieces, among them, Sir Henry Wood, Fritz Reiner, Rudolph Ganz, Walter Henry Rothwell, Alfred Hertz, Emil Oberhoffer, Ernest Bloch, Willem van Hoogstraten, Howard Hanson, Samuel Gardner, Ethel Leginska, Eugene Goosens, Pierre Monteux, Bruno Walter, Albert Coates, Bernardino Molinari, Alfredo Casella, Pietro Cimini, Pedro Sanjuan, Henri Verbrugghen and Percy Grainger.

Those responsible for the concerts feel that they have already demonstrated several things: that a large representative section of the great American public has proved its appreciation of "highbrow" music in an open-air setting; that delicate shades and tones of the music need not be lost out of doors; and that the best music can be furnished at a popular price without causing a deficit.

AN AIRPLANE VIEW OF HOLLYWOOD BOWL

State Regulation of Roadside Advertising

ONLY seven states are without regulations governing commercial advertising signs along public highways, according to a recent statement by the Bureau of Public Roads of the U. S. Department of Agriculture. These states are South Carolina, Arkansas, Texas, New Mexico, Oklahoma, Kansas, and Wyoming. Connecticut, Massachusetts, and Vermont have the most clearly drawn and the most rigid restrictions. Licenses for which annual fees are charged are required for billboards and other commercial display signs in these states, and if the agency erecting them is from outside the state, a bond is also required. The state authorities reserve the right to exact fines for non-conforming signs and to remove them. In Connecticut the fine is $100 for each non-conforming sign; in Massachusetts a fine of not more than $100 is imposed, with a further $500 for continued violation; Vermont fixes the fine at $100 or imprisonment for 30 days, or both.

In Connecticut any person who shall deposit, throw, affix or maintain any advertisement within limits of any public highway or on private property without consent of the owners is subject to a fine of not more than $50, or imprisonment of not more than six months or both. Both Connecticut and Massachusetts have gone further; Connecticut forbids advertising signs placed upon private property within 15 feet of the right-of-way of a highway; Massachusetts within 500 feet. Cities and towns in these states may also go further, under the state laws, in the regulation and restriction of advertising signs within their limits. Local authorities in all of these three states may remove non-conforming signs within their jurisdictions. Laws of these states as well as of other states permit certain advertising by manufacturers or landowners located along highways.

Seven other states impose fees for advertising signs: Florida, Georgia, Mississippi, Nebraska, Nevada, North Carolina, and Tennessee.

Only Nevada of all the states refuses to grant permits for the erection of billboards or other form of signs on any location where they will mar the natural beauty of the scenery.

In nine other states—Minnesota, Colorado, Maine, Iowa, North Dakota, South Dakota, West Virginia, New Hampshire, and Illinois—no advertising agency may erect or maintain upon any highway or right-of-way any commercial advertising sign. In eight of these states authorities have power to remove all non-conforming signs, and in seven states to exact fines of from $5 to $1,000 or imprisonment of from one to six months. Three of the states regulate distances from railroad crossings, road intersections, and curves at which signs may be placed. These distances range from 300 to 1,000 feet.

The laws of 16 other states—California, Maryland, New York, Idaho, Michigan, Washington, Montana, Ohio, Oregon, Pennsylvania, Louisiana, Missouri, Rhode Island, Utah, New Jersey, and Wisconsin—prohibit advertising signs on private property without consent of owners and on rights-of-way of highways without consent of the state, city, or county authorities.

In six states—Alabama, Arizona, Delaware, Indiana, Kentucky, and Virginia—laws governing advertising signs merely state that no person shall erect or maintain upon any highway or right-of-way any advertising sign without consent of state authorities. While Arkansas has no state regulations, authority governing advertising signs is vested in county courts with no specific legislation. In Texas cities of more than 5,000 inhabitants have power to license, regulate, control, or prohibit erection of signs or billboards as may be provided by charter or ordinance. In Oklahoma, county and township boards are charged with highway improvement and have power to remove all obstructions in highways under their jurisdiction. Wyoming has no state regulations, but the Highway Department claims jurisdiction over rights-of-way and assumes authority to refuse permission to erect advertising signs and to remove any of these. In Kansas, the county commissioners of each county are authorized to remove all advertising signs exceeding 4 feet in height from within 50 yards of any railroad grade crossing, abrupt corner in the highway, or entrance to driveway off the highway, after notice has been served on owner. New Jersey prohibits advertising signs on the Palisades, New York bars them from Adirondack Park, and Delaware from the vicinity of Wilmington.

Are We Spending Too Much—or Too Little—on Our Public Schools?

A NOTABLE extension of educational facilities and a corresponding increase in expenditures for education took place in the United States following the war, the movement being given a special incentive by the revelations of inadequate schooling and sheer illiteracy brought out by the examination and observation of nearly six million men in connection with the draft. After a large addition to educational facilities during the first years of peace, resulting in a considerable improvement in the situation compared with pre-war conditions, there was a slowing-up, expenditures remaining at a fairly even level over a number of years. Opposing claims are now made: that the improvement has by no means gone far enough and that efforts should be further increased; and, on the other hand, that as much money is being spent on education as the community can wisely be called upon to provide.

The National Education Association discusses this matter in the November, 1928, number of its *Research Bulletin*, published at its Washington headquarters. It states that one-fourth of the men called in the draft were inadequately equipped in ability to read and write; that the war showed both the tremendous handicap of illiteracy and the benefit of adequate education, and "brought home to the American people the tragic wastefulness of poor schools, and of no schools at all."

Real progress has been made in the post-war years in various ways:

Larger Attendance

First, the amount of schooling has increased, the aggregate days of attendance in all public elementary and secondary schools being 41 per cent greater in 1926 than in 1915, this being accompanied by greater emphasis on the extension of education into the higher ages, as well as the giving of some schooling to the million and a half children between seven and thirteen reported in the 1920 census as attending no schools at all.

Better Equipment and More Adequate Sites

Second, a general improvement in the physical facilities for education has occurred. "Abundant health cannot be expected if children sit in cramped seats in poorly lighted, heated and ventilated buildings. Strong physique cannot be developed on two-by-four playgrounds. The American people realized that the first step in removing the physical deficiencies revealed by the war should be the provision of modern school plans. . . . After proper allowance is made for the lowered purchasing power of the dollar, more money was expended for school buildings and sites in the five years 1921 to 1926 than in the whole thirteen years preceding this period. Many communities have almost completely rebuilt their schools. Well-lighted, well-heated, well-ventilated buildings have replaced jail-like structures. School grounds have been enlarged. Whereas an acre or two was frequently the allotment for an elementary school before the war, not less than five acres is coming to be the minimum in many cities, while sites for junior and senior high schools are several times five acres in many communities. Gymnasiums and athletic fields are a recognized part of modern school plants."

Higher Standards for Teachers and Curriculum

Third, the qualifications for teachers, and likewise the salary schedules, have been raised, so that greater ability in instruction has been provided and better treatment has been accorded the teacher. The gain in remuneration is not due merely to the changed value of the dollar, but is somewhat in excess of the increase for employed persons generally, thus constituting a greater recognition of the importance of teaching.

Fourth, there has been improvement in curriculum, and clarification of the aims of the schools.

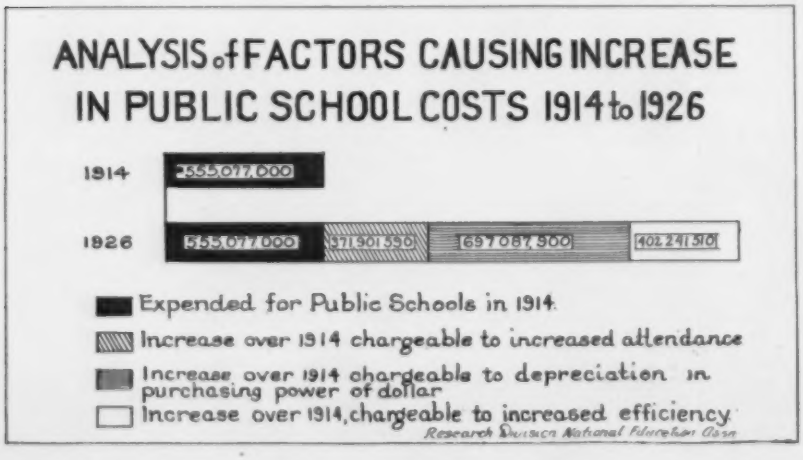
Fifth, school financing has been reorganized to a considerable extent, changing the basis, increasing the receipts, and moving towards better equalization of educational opportunities among separate geographical districts.

A Goal Not Yet Attained

"But while significant advance has been made in all of these directions, the goal has been reached in none. There are still places where children are given the most meager of educational opportunities—in more than a fourth of the states children on the average attend school less than six years. This means that thousands of children go no further than the third or fourth grade. In only one state in four is the average length of schooling per child as much as eight years. We still have far to go before we will be giving all children a complete schooling.

"There are children still attending school in poorly lighted, improperly ventilated, and in many cases, unhygienic buildings, situated on wholly inadequate sites and lacking equipment essential to a modern program in health and physical education."

Both the requirements and the pay for teaching are still meager in thousands of communities; the curriculum of thousands of schools is practically obsolete; and adequate educational financing has been achieved in but a few states.


ANALYSIS of FACTORS CAUSING INCREASE IN PUBLIC SCHOOL COSTS 1914 to 1926
1914
2555,077,000
1926
2555,077,000
971,901,550
697,087,900
402,241,510
Expended for Public Schools in 1914
Increase over 1914 chargeable to increased attendance
Increase over 1914 chargeable to depreciation in purchasing power of dollar
Increase over 1914, chargeable to increased efficiency
Research Division National Education Assn

The Strain Does Not Exceed Ability to Pay

Taking up the question of the country's ability to support increased education, the bulletin points out that expenditures for public schools amounted to 2.68 per cent of the total income of the people of the United States, in 1926, the latest year for which the data are available; and the investment in public school plants was only 1.44 per cent of the total national wealth, as shown in the following table:

WEALTH AND VALUE OF SCHOOL PROPERTY IN THE UNITED STATES IN 1926

Item	Amount	Per Cent of Wealth
Wealth (value of all tangible property)	$375,000,000,000	100.00
Value of property of public schools:		
Elementary and secondary	$4,676,603,539	1.25
Colleges and universities	*714,523,814	.19
Total (public)	$5,391,127,353	1.44
Value of property of private schools:		
Elementary and secondary	$911,544,000	.24
Colleges and universities	*1,822,414,119	.49
Total (private)	$2,733,958,119	.73

Sources: value of school property calculated from figures of the United States Bureau of Education; wealth estimate based on figures of United States Department of Commerce.
(*) Includes endowments and similar productive funds.

It is shown also that the annual expenditure for public schools is less than that for life insurance, not much more than for tobacco, and less than one-fifth of what is spent annually for the purchase, operation and upkeep of passenger automobiles. As further evidence that the present cost of education does not place a strain upon the ability of the nation to pay, the bulletin presents figures showing that: "The per cent of tax money expended for public schools was 23.77 in 1913 and 23.69 in 1926. School expenditures required a smaller per cent of all taxes collected in 1926 than in 1913. From 1923 to 1926 the per cent of the nation's tax bill allotted to public school support has remained practically stationary, never dropping as low as 23 per cent nor rising as high as 25 per cent."

The total expenditure for education, expressed in dollars, has, of course, increased greatly since before the war, but this is chiefly accounted for by depreciation of the dollar, and by increased attendance, leaving a minor, though substantial, part for the betterment of the service rendered. This is indicated on the chart (page 114).

By reducing the expenditures in 1914 and in 1926 to the amounts expended for each day of attendance (a high school day being counted as 2½ elementary school days), and then converting the 1926 amount into its purchasing equivalent in 1914, the booklet shows a 29 per cent increase of the 1926 unit over that of 1914, as compared with a superficial increase of 265 per cent, in the total dollars spent in the two years. In view of this it is said, "An intelligent comparison of the school expenditures of today must therefore be based upon a measurement of the economic power of these expenditures to purchase in the open market those things essential to school maintenance."

Directional Traffic Control Demonstrates Efficiency

By RICHMOND D. MOOT
CHAIRMAN, CITY PLANNING COMMISSION, SCHENECTADY, N. Y.

EXPERIENCE has demonstrated that the most efficient speed for motor vehicles is between 15 and 20 miles per hour, because at greater speeds the time and distance required to stop, and consequently the increased clearances necessary between cars, decrease the number of cars which can pass a given point per minute. To operate traffic at this speed, the street width between curbs should be divisible into 10-foot traffic lanes. If part of the pavement is to be used for parallel parking, an 8-foot parking lane is sufficient.

In the congested sections of New York City, Chicago and other cities, where pavement widths bear little or no relation to the exact width of any number of traffic lanes, traffic congestion is inevitable because of faulty pavement design, regardless of the problem of traffic control at intersections; and yet this fault in design may be easily corrected by resetting curbs so as to produce standard width traffic lanes for the most efficient movement of traffic through the streets.

To Keep Traffic Moving

Stopping traffic with a red light is not regulation, but prohibition; nor is there any excuse for stopping all traffic at a street intersection except where the streets are so narrow that no turning movement can be made without danger to other traffic or to pedestrians. Very few street intersections are of this character, and the use of a red light should therefore be the exception and not the rule. If a car may safely make a right turn into a cross-street while traffic is flowing in the cross-street, an illuminated arrow in the traffic signal pointing to the right indicates that this turn and this movement only may be made. Under such conditions a red light should never be used, because red means "stop." It does not mean go right, go left, or go ahead. This is the principle of directional traffic control. Each traffic light has a clear and unmistakable meaning,

TRAFFIC CONTROL AT A SCHENECTADY, N. Y., INTERSECTION

This photograph has been furnished by the Schenectady Chamber of Commerce to illustrate how heavy left- and right-turn traffic movements are handled with the directional control signals at the intersection of State Street and Erie Boulevard in Schenectady.
The traffic coming from the left has the ordinary green signal, permitting movement straight ahead and to the right, and also an arrow signal pointing left, permitting this traffic to run at full speed in all directions. At the same time cars coming toward the observer have an arrow pointing right permitting cars to turn right but not permitting them to cross the left-turn movement. The car in the foreground is also approaching the street intersection to execute a right turn under the authority of a right-turn signal. Cars coming from the right also have a right-turn signal, making a total of six traffic movements authorized at the same instant. The rapidity with which cars clear this intersection on the short-time cycle used makes it difficult to get cars enough at the intersection to show all movements taking place at the same instant

not subject to variation by any local rule or regulation. Each traffic signal tells traffic where it may go with safety, and each traffic movement is protected by all the other traffic signals at the intersection so that there are no collision points.

Boston conceived the idea of an arrow lens to indicate direction. Schenectady has used the arrow lens to bring all traffic under complete directional control. With it, left turns are indicated when they can be made with safety, and right turns are authorized when the design of the street intersection is such that right turns should be permitted even when a forward movement would be unsafe. A red lens means "stop," and it is fundamentally wrong to permit either right or left turns against a stop signal. If a turn is to be permitted, it should be indicated by the traffic signal. It should not be authorized by local regulation in violation of the signal. The signal should be honest and its meaning clear to all.

Minimizing Dangers and Delays from Left Turns

New York and Chicago would profit by the adoption of the arrow lens and its use in authorizing turns whenever they can be made safely. With it, the danger and traffic delays resulting from left turns are eliminated. Left turns are authorized at a time when there is no conflicting traffic moving, and traffic is thus encouraged to use the shortest and most convenient routes.

The alternate east-bound and west-bound one-way streets crossing the avenues in New York offer an ideal application of the directional control principle with a marked increase in the traffic capacity at street intersections, and the practice in the Loop district in Chicago of going around the block because necessary left turns are prohibited would be easily and safely avoided to the advantage of everyone. Prohibiting left turns at points where left turns are desirable solves no problem. The problem is to permit left turns at such points when they can be made with safety and dispatch and without interference with other traffic. Under the directional control system this is easy.

Two years' experience with directional control in Schenectady has demonstrated that it is feasible and efficient where the old fashioned "stop and go" lights alone were a complete failure, and as all traffic directions are given by the traffic lights, there is no occasion for supplementary police direction or interference. The problem of the traffic officer, if one is used, is merely to speed up traffic and keep it moving in accordance with the traffic signals. Based on the experience of Schenectady and a careful study of traffic problems in New York and other cities, it seems that the use of directional control with progressive timing on Fifth Avenue, New York, or on Michigan Avenue and in the Loop district, Chicago, should increase the traffic capacity of the present streets at least 50 per cent, with a corresponding reduction in traffic congestion at street intersections and similar decrease in the time required to travel from one point to another.

The Cities' Share of Gasoline Taxes and Motor-Vehicle License Fees

IN connection with the proposal now before the Legislature that New York State impose a gasoline tax, the State Conference of Mayors and Other Municipal Officials has addressed a petition to the Legislature that a fair share of the revenue from such tax be granted to the cities and villages.

In support of this position, the General Legislative Committee of the Conference calls attention to the fact that recent state statutes are giving liberal recognition to the city equity in state-collected automobile license fees and gasoline taxes. Already, twelve states are granting direct state aid to their cities. These and their plans of distribution are as follows:

Alabama.—20 per cent of the motor-vehicle license fees collected in the city limits is given to the cities.

Indiana.—One-fourth of a cent for each gallon of gasoline sold in the state is given to the cities on a population basis.

Iowa.—$200 per mile is given the larger cities for the maintenance of state or primary roads, and, in the cities of 2,500 population and less, the state constructs and maintains the state and primary roads.

Kansas.—Cities of the first and second class are given $250 for each mile or fraction of a mile of state-road street. In the cities of the third class the county commissioners have the option of giving the cities $250 for each mile or fraction of a mile of state-road street, or they may maintain the streets.

Louisiana.—An extra tax of one cent a gallon is collected for each gallon of gasoline sold in the city of New Orleans, this sum being placed in the paving fund.

Maryland.—1.7 cents is paid the city of Baltimore for each gallon of gasoline sold in the state of Maryland. The money is used for the building and maintenance of streets and for providing grade separations.

Michigan.—The state gives each city $2,000 per mile for each mile of state highway in the city limits. (A 1928 statute.)

Ohio.—The cities are given 50 per cent of the motor-vehicle license fees collected in the city limits, and 30 per cent of the gasoline taxes collected in the city limits.

Oklahoma.—The cities are given 15 per cent of the motor vehicle license fees collected in the city limits.

Virginia.—The state constructs and maintains the state road in cities of less than 2,500 population having houses more than 200 feet apart.

Washington.—The state gives each city $300 per mile for each mile of state highway in the city limits. (A 1928 statute)

Wisconsin.—The state gives the larger cities $300 to $500 per mile for the maintenance of state-highway streets in the city limits, and from $25 to $200 per mile for city streets not a portion of the state or county road system. (A 1928 statute.)

EDITORIAL NOTE.—According to the Vermont State Chamber of Commerce (St. Albans, Vt.), Illinois and New York are the only states without a gasoline tax. On February 1, 1929, there was a tax of 5 cents per gallon in seven states—Arkansas, Florida, Kentucky, Mississippi, New Mexico, South Carolina and Virginia; 4 cents in twelve states—Alabama, Arizona, Georgia, Idaho, Louisiana, Maine, Maryland, Nevada, New Hampshire, North Carolina, South Dakota, and West Virginia; 3½ cents in one state—Utah; 3 cents in fourteen states—California, Colorado, Delaware, Indiana, Iowa, Michigan, Montana, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Vermont, and Wyoming; and 2 cents in twelve states—Connecticut, Kansas, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, North Dakota, Rhode Island, Texas, Washington and Wisconsin; the District of Columbia also has a 2-cent tax.

When the Cop Turns Pedagogue

A Good Time Is Had by His Students, and Casualty Figures Decline

"NOW here's a bird, an' I want yuh all to see what happened to him just because he hadn't the brains to drive a baby buggy." Smithy is speaking; Smithy, alias the Motorcycle Officer of the Jamestown, N. Y., Police Department. Suspense holds his young audience on the frontmost rim of its seats—suspense and a fascinated interest such as some cops, in common with pirates and aviators, inspire.

"He's beatin' it up Such-and-Such a hill, see?" the tale goes on, "an' up he comes up behind a truck crawlin' up to the brow of said hill. This guy can't see what's comin' up the other side of the hill, but that don't mean nothin' to him—*he can't wait*. So out around the truck he swings—right square into the nose of another big truck comin' his way whose driver is beatin' it home to supper—and I want yuh all to see what happens." A dramatic pause is followed by a flashing upon the screen of the results.

"Well," concludes Officer Smith, "that guy won't never climb no more hills in this world—and mind you, he killed *himself*. It's always an invitation to suicide to beat it over any hill when you can't see what's headin' your way."

Officer Smith, who knows the value of the visual appeal in education, has a whole Chamber of Traffic Violation Horrors in slide form, developed with the aid of a Jamestown photographer. For every one he has a dramatic monolog that he presents with the same unsqueamish thoroughness that has won him the title of "Hardboiled Smith" with a certain rather large class of careless motorists of his town. And the youngsters love it. A recent issue of *Motordom*, the magazine of the New York State Automobile Association, carried an interesting account of Officer Smith's safety work with the children, and of the extent to which the Jamestown Automobile Club, cooperating with the city's Police Department, has acted as his lecture agency, booking him for traffic safety talks, not only at home, but in the surrounding communities he can take the time off to cover.

The Operation of a Well-Organized Meter Department

By C. J. ELD AND J. J. ROST

METER DEPARTMENT, SOUTH PITTSBURGH WATER CO.

SELLING water through meters has become nearly a general practice, resulting naturally in a rapid increase in the number of meters in use, and requiring that increased attention should be paid to their proper care and supervision.

These remarks will have served their purpose if they call the attention of water-works that use meters to the importance of having a department, properly administered, to select the proper make and type of meter for every service condition and to see that this meter is properly installed and maintained thereafter, so that the water-works is assured of the income justly due it.

At this plant, the South Pittsburgh Water Co., we are sold on the idea of handling and selling water by meter measurement, and consequently are 100 per cent metered, requiring the testing, installation, and maintenance of over 34,000 meters ranging in size from ⅝-inch to 4-inch to care for the needs of our patrons, while in our own interplant use there are meters varying from the ⅝-inch disc to 36 x 12-inch venturi meters. These are working under pressures varying because of topography from 40 pounds to 250 pounds.

Keeping Track of the Meters

The proper care of meters requires a well-indexed card or loose-leaf book system. Every meter should be represented by a card or leaf on which should appear its test, cost of repairs, history, etc. Careful study should be made of these cards from time to time. If the cards show that certain meters are being removed for repairs at short intervals, investigation should be made of service conditions under which these particular meters are operating, with a view to determining whether the meter used is of the proper size, make, and type.

Frequent comparisons of meter readings should be made with the corresponding period of the previous week, month, or year. An appreciable fall in consumption should be investigated, with a view to determining the cause; such as whether by-pass connections are properly closed and sealed; whether the owner is getting some or all of his water through an entirely different pipe, if

VIEWS OF THE SOUTH PITTSBURGH WATER CO.'S METER DEPARTMENT SHOP, SHOWING TESTING AND REPAIR EQUIPMENT AND REPAIR PARTS FOR VARIOUS KINDS AND SIZES OF WATER METERS

FORM S. P. 34

SOUTH PITTSBURGH WATER CO.

Account No. 74-138 Service No. 17648

Harold Watson 6-6-1928

168 Spruce St. Lincoln Place

Check Meter Size 5/8 Make Trident No. 1946560

ReRead Meter Reads 6/8-1928 249 000

6/4/28 247 000

3/5/28 220 000

Inspect for Leaks Remarks:

Read by

FORM 34 FOR INSPECTORS' REPORTS AFTER INVESTIGATION OF INCREASED CONSUMPTION

there has been a partial or entire suspension of operations of the owner; or whether the meter is stuck or partially stuck and is not registering accurately on all flows, etc. In any event the meter department should not relax till a sure and certain solution of the decline in consumption has been determined and the remedy applied, that is, meter repaired, pipes changed, etc.

Meter Readers Are Also Repair Men

Reading of meters at this plant is done usually by those who are repair meters. Excepting 1½-inch and larger meters, the reading is done quarterly, one-third approximately each month. This system permits of less crowding and jamming of patrons at the office during the "pay period" and allows clerks opportunity to wait on them carefully, and also permits the office to handle the billing with facility with the least number of clerks and avoid useless rush with attendant worry and possible mistakes. The larger meters are read weekly and, if conditions demand, oftener, but are billed monthly.

The Meter Department an Important One

To maintain the morale of the meter department at a high point of efficiency, like any other continuous work, requires even in the smallest plant that a certain definite room or rooms, or space properly heated and lighted, be permanently allotted to that purpose. The department cannot properly be the football or plaything of the plant.

It should have a feeling of its just importance. Everything should be maintained in a neat and clean condition, with new meters and parts carefully stored and recorded; the necessary tools, benches and testing apparatus should be kept in good condition, dry and easy to manipulate accurately.

Accuracy of Meters Important

Since we have been selling water on the unit basis the meter has become of great importance in recording the units used or sold. The meters work constantly for us, tallying these units, and it would be hard to dispense with their services. Years ago we sold water on a flat-rate basis for a stated quantity, and then an additional charge for the excess. Meters then were not so important as they are to-day, as we now base our price on a unit of 1,000 gallons.

With 34,000 meters in use, a small loss through each of them would, in the aggregate, be far greater than the cost of a modern and efficient repair department. Consequently, we give this department much attention, and the aim of the department is to have each meter as nearly as possible in perfect working condition. This department is closely associated with our other departments, and is located on the basement floor below our complaint and record-keeping and operating departments, in order to have close cooperation. They are directly in contact with each other.

The Complaint Department

The complaint department is composed of young men who receive all complaints courteously and thoroughly investigate the validity of each one reported. These complaints usually are in regard to meters. A communication is had immediately with persons in charge of the meter department. One of the most common complaints is that a leaking meter has developed. The clerk then fills a blue form, No. 99, which is promptly given to the meter department. If a consumer reports the transfer of his property, then Form S. P. 108, on pink paper, is used. However, many of the complaints will be for increased consumption. In such cases an inspector is dispatched to the consumer, and usually a leak is found somewhere on the premises. The inspector's report is made on Form No. 34, printed on blue paper, and is then placed with the complaint department, which sends a written notice to the consumer advising him

Account 74-138 No. A 18793

Charge Service 17648 Date 10-15-1928

Take Out

Turn off **SOUTH PITTSBURGH WATER CO.**

Set Name Harold Watson

Turn on Address 168 Spruce St. Lincoln Place

	METER SET	METER TAKEN OUT
Size	5/8 Make Emp.	5/8 Trident
Number	531230	1946560
Reads	643 000	260 000
Remarks		Meter Leaking
By	W. H. 10-16-1928	W. H. 10-16-1928

Ent'd. on Ledger By

SOUTH PITTSBURGH WATER CO.

Property Sold Read 11/14-28

Account No. 74-138 Service No. 17648

Name Harold Watson 11/13-1928

Location 168 Spruce St. Lincoln Place

Meter Size 5/8" Make Emp. No. 531230

Meter Reads 11/14-1928 648 000

Previous Reading 10-16-28 643 000

Consumed 5 000

Former Owner Address 3042 Shady Ave. Pittsburgh

New Owner S. J. Haines From

Mail Appl. Address above

Read by W. H.

COMPLAINT AND TRANSFER FORMS USED BY THE SOUTH PITTSBURGH WATER COMPANY

At left, this Form 99 on blue paper is used when complaints of leaks or under and over registration are made. At right, this Form 108 on pink paper is used to record transfer of property

of the reason for the increased bill and suggesting that the leak be remedied at once to avoid future waste.

Meter Reading

Our meter department consists of about twenty men who devote all their time to the reading and maintenance of meters, each man being assigned a certain phase of the work. Since it is also the duty of the men who read the meters to maintain them, they discover various necessary repairs while making readings and report these needs promptly on a regular form. By this method we early ascertain when a consumer has greatly lessened or increased his consumption, and investigation can be made. For instance, if the amount of water used has decreased greatly, the meter man will run water to see if the meter is working at all.

The same reading sheet is used for about two years, the first reading being placed at the bottom of the sheet and subsequent ones listed upwards. These men, acting in the dual capacity of readers and repairmen, become quite familiar with the meters and the conditions under which they are set and working, and can better understand and appreciate the function of meters and become increasingly more valuable to the company.

The Meter Register

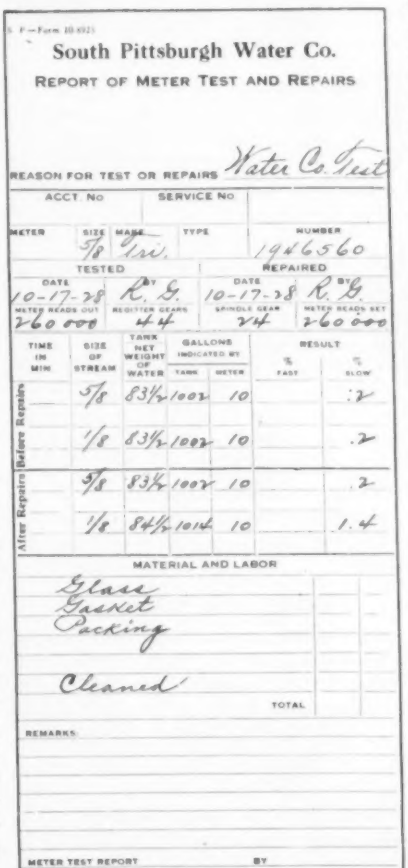
A very complete history and record of each meter is also kept in what we call our meter register. This is a 10 x 16-inch sheet ruled off into columns. It contains the name of the meter, its number, size, and owner, and ten columns which are subdivided into two columns each for date and account number respectively. Each line containing the meter number is subdivided into two lines. The top sub-line is for the setting record, giving the date set and the account number; the lower line is for the removal record, showing the date and the word "out" written under the account number. The dates of the test cards are also posted to this meter register and recorded in the last few columns on the right-hand portion of the sheet. A record of each meter is thus always available, and every change is noted over a long period. We believe this method is much better than the card system, because the clerks can take the books to their desks and work without interruption. Cards also become mislaid, and a great number of cards would be necessary. By this method we maintain meter records in six meter registers, each about 2 inch thick, and find little difficulty in recording or getting the information desired.

Meter Testing

The Public Service Commission of this state requires that each meter be tested every ten years. To insure against defective meters we test each meter on an average of every five years. The larger consumers have more frequent testings.

SIZES OF STREAMS AND QUANTITIES USED IN TESTING METERS

Sizes of Meters	Quantities Used	Sizes of Streams
5/8"	10 gallons	1/8" and full
3/4"	10 "	1/8", 1/4" and full
1"	10 "	1/8", 1/4" and full
1 1/2"	10 "	1/8" and 1/4"
	500 "	1/2" and 1"
	1000 "	full
2"	10 "	1/8" and 1/4"
	500 "	1/2" and 1"
	1000 "	full
3"	100 "	1/4" and 1/4"
	500 "	1/2" and 1"
	1000 "	2" and full
4"	100 "	1/8" and 1/4"
	500 "	1/2" and 1"
	1000 "	2", 3" and full



South Pittsburgh Water Co.

REPORT OF METER TEST AND REPAIRS

REASON FOR TEST OR REPAIRS Water Co. Test

ACCT. No. SERVICE No.

METER SIZE 5/8 MAKE Tru. TYPE NUMBER 1946560

TESTED		REPAIRED	
DATE	10-17-28	DATE	10-17-28
BY	R. G.	BY	R. G.
METER READS OUT	260 000	METER READS SET	260 000
REGISTER GEARS	44	SPINDLE GEAR	24

	TIME IN MIN	SIZE OF STREAM	TANK NET WEIGHT OF WATER	GALLONS INDICATED BY TANK	GALLONS INDICATED BY METER	RESULT % FAST	RESULT % SLOW
Before Repairs		5/8	83 1/2	100 2	10		.2
		1/8	83 1/2	100 2	10		.2
After Repairs		5/8	83 1/2	100 2	10		.2
		1/8	84 1/2	101 4	10		1.4

MATERIAL AND LABOR

Glass
Gasket
Packing

Cleaned

TOTAL

REMARKS

METER TEST REPORT BY

CARD FOR REPORT OF METER TESTS AND REPAIRS

When a testing is made, the old meter is removed and another one immediately substituted. The substitute may be an entirely new meter or one which has been tested and overhauled. An accurate record is made of each meter and each testing. Each meter is stamped with its number, and its record card, Form 10-8925, is filed according to that number. This card contains a record of the stream tests made both before and after repairs. All meters are adjusted to as nearly perfect working condition as possible, usually being considerably less than 1 per cent either fast or slow. In addition, this card contains the name of tester, date, reading of the meter, make, and size of meter, and sizes of streams used in the test, together with a list of material and labor expended on it.

The schedule at the top of the page shows the size of streams used in testing our meters.

The South Pittsburgh Water Co. considers the lowest-size orifice and full-stream test all practically needed, experience showing that for the intermediate streams the meter will be reasonably accurate, if it is accurate on these limit streams. A complaining consumer, however, may have tests made for each size orifice shown on the above table. Every new service to house or factory is equipped with a brand new meter.

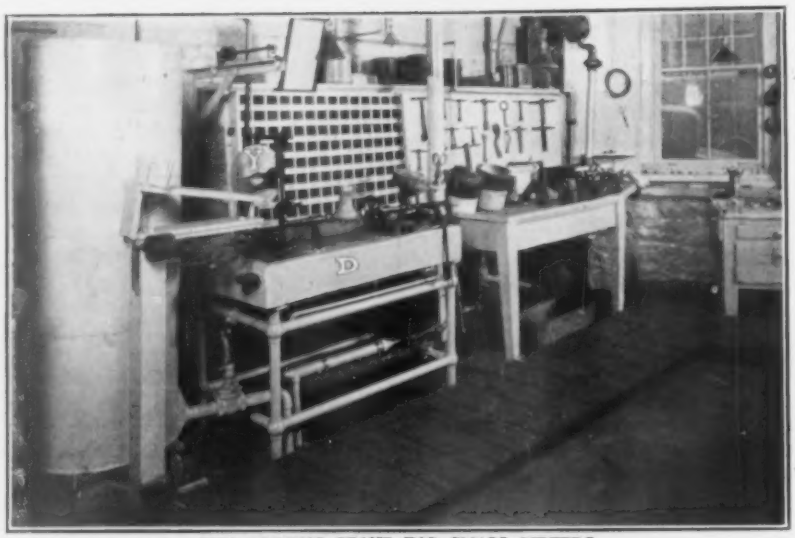
Meter Setting

Every meter, new or old, is tested on our own testing apparatus, of which we have two sizes, one of the calibrated type for the large meters and several of the scale type for the smaller. Before setting, the register of each meter is sealed with copper strip wire and lead seal. A seal also is attached to the inlet coupling of the meter to prevent tampering with the meter after being set.

Our meters usually are set singly and of such size that they will be working half to three-quarters capacity under usual conditions. However, if more volume and continuous service is demanded, the larger size 1½-inch and upward, are set in batteries with a valve on both inlet and outlet ends, and provision made by use of Dresser sleeve, etc., so any one meter can be easily removed. The larger meters are usually housed in brick or concrete boxes having ladders to permit easy access. They are often located on the sidewalk or on the consumer's property, especially if for a factory. The small meters, ⅝-inch to 1-inch, are placed, if possible, in the property owners' cellars, basements, etc. Where this is not feasible, the meter is placed in the sidewalk within an inverted 18-inch sewer tile covered simply with a cast iron frame and lid, since no intermediate cover is necessary in our climate.

Orifice plates are inserted in the outlets of meters where jerking strains, lashing, water-hammer and excessive pulls are expected.

Many added expenses are incurred during the winter time. The number of repairs found necessary increases greatly



THE TESTING STAND FOR SMALL METERS

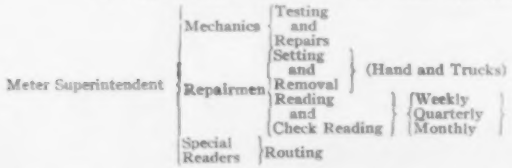
during this season. The consumer is taxed a small amount for repairs to his frozen meter, thus making him more careful with regard to it.

Organization of the Department of Meters

All meters to be repaired are given to three or four repairmen under the direct supervision of an expert mechanic who thoroughly understands their mechanism. Repairs must be made daily as the meters are brought to them, so that the number of them to be repaired does not increase greatly over the daily average. These repairmen are provided with any equipment necessary to accomplish efficient handling of work brought to them. They have all the modern time-saving devices and tools of high quality.

This department is as systematic in the storage of repair parts and stock meters, tools, etc., as in filing records. A special rack is provided for gears and their size listed below each opening. Other repair parts are similarly designated, whether placed in racks, shelves, drawers, etc., and plainly marked so that no time is lost in looking for any particular part or tool. This gives the whole compartment the appearance of a mod- and efficient meter department cannot ern hardware store with shelves, etc., for its merchandise. The floor is cleaned often and the shelving and racks well painted. While it consumes a little time to maintain a system of this kind, we believe it is profitable.

ORGANIZATION DIAGRAM OF THE DEPARTMENT OF METERS



Water Meters Are Cash Registers

The importance of a well-maintained be stressed too much. Since meters are the basis of recording the company's sales,—the cash register, as it were,—they are deserving of strict attention, and it is to the interest of the water company that they be made as accurate as possible. Since there is no known quick means whereby a check can be made of the loss of water, the only assurance a company can have that it is getting its full amount of revenue is the realization that it is doing every thing possible to check loss through defective connections, pipings, and particularly meters. A well-maintained meter department is costly, but it is an economy when the losses that may occur are considered.

Meter-Testing Equipment

The testing apparatus herewith shown and described is the product of the combined efforts of Clarence H. Kelley, now Superintendent of Water-Works at Wichita, Kans., and our present Superintendent of the Meter Department, John Grimm. Their aim was to produce apparatus that could be easily and quickly adjusted and that was as compact as possible.

The testing outfit D has a shallow reinforced concrete slab sink supported on iron pipe legs, this body in turn carrying the meter spud supports, one of which is hydraulically operated, permitting almost instant setting and removal. The 2-inch brass hydraulic cylinder attached to a horizontal strut beneath the sink about one foot from the floor provides the needed leverage for adjusting the meter spud support. The brass circular orifice plate shown at Y has all sizes of orifice openings cut and numbered on one diameter circle. This plate is released by a lever-operated cam, permitting it to be turned almost instantly to the desired opening, and again clamped; this, with the lever-operated quick-opening valve on the inlet, makes testing consume but a short time.

The testing outfit E and tank F were designed to handle 1½-inch up to 4-inch straight or compound meters. The meters placed on the platform are lifted or lowered hydraulically to position and then bolted to the supply pipe between flanges, which are sized and drilled to accommodate almost any meter. The orifice plate has its various sized openings, and is hydraulically adjusted so that the desired proper-size orifice opening is thrown into the outlet pipe at the instant the pointer reaches the figures on the vertical scale alongside this movable plate. It is gripped by a reversible ratchet lever acting on a nut and steel bolt.

The 1,500-gallon steel tank is calibrated from 0 to 1,450 gallons and has the various volumes indicated on a permanently attached vertical scale with an adjacent glass tube showing the water level and indicating quite readily the volume.

In the small stream test the small inlet and outlet pipes are used in conjunction with the little graduated tank attached to the upper edge of the large tank.

Owing to the growth of this plant, a third No. 1 testing outfit, made by the National Meter Co., was removed from this building and set up in the new shop at the pipe yards about two blocks from the main office. This outfit is used exclusively for testing ¾-inch and 1-inch meters.

It is practically impossible to describe or show the amount of material carried in our supply storage room, all carefully sized and racked to meet the demands of various kinds and sizes of meters used.

Transportation Facilities

The meter department has five new Ford "pick-up" body cars furnishing the needed transportation. When conditions permit, the work of removing and substituting meters is concentrated in a portion of the territory. A toolbox is placed on the car and metermen change meters, using this box as the safe storage of a supply of properly conditioned meters and for those removed. This does not tie up the vehicle for any great length of time and permits the exchange

removal to go along unhampered in that district, while the driver, who also is a meterman, can install new meters at points scattered throughout the system.

Each driver is responsible for his work and the condition of his car, but no repairs on autos, except of very minor nature, are made by him. The auto mechanic gives each car an inspection monthly and oftener if necessary.

All metermen are provided with uniform caps showing distinctly the company's name. We have found this much more satisfactory than badges; the latter are lost, strayed, or stolen, and are an endless nuisance.

Routine

Only after being supplied by the Superintendent with needed "Meter set" or "Meter take out" cards routed by the Superintendent or by some meter reader who has acquired detailed knowledge of routes by study and the practical work in reading, re-reads, etc., do drivers load up for the day's work. The assessor, having ascertained by inspection that a patron desires water, has filled out and delivered the "meter set" cards to the Meter Superintendent.

The "Meter take out" cards are made out by the billing clerks at the direction of the Chief Clerk, who has instructed them to heed carefully the meter reader's notations, time elapsed since the meter was set, quantity passed through it, and such other additional information coming from what is regarded as reliable sources, such as bad treatment of meter, fraudulent intentions, non-payment, etc.

Naturally, the Meter Superintendent desires to make "Take outs" and "Sets" balance as nearly as conditions will permit, and save needless waste of gasoline, tires, and time traveling. The carbon copies in the stub book make up a serially numbered record of all "Sets" and "Take outs," and these books are carefully preserved at the main office.

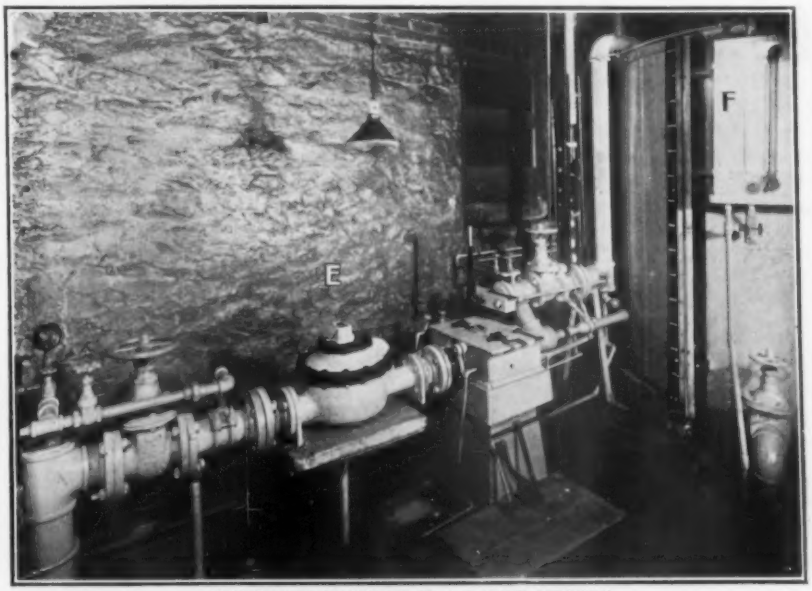
The Meter a Helpful Detective

Like all instruments, the meter should be proportioned for the work expected to be done; otherwise, its registry of water will be below what it should be and give the Company a "raw deal." Once set, the meter remains at work many years with only the occasional quarterly or monthly visits of the Company's meter reader. Of course the property owner will once in a while glance at it, but more often he shies a piece of coal or brick or old blocks, furniture, etc., against its body and forgets it is there until a bill comes in showing how careless he has been, not only with the meter but with the toilets, sinks, garden hose, etc.

Consulted, meters are a wonderful check on needless waste. How quickly even a wasteful use of hot water and steam, and with it of fuel, is detected: Meters require, like man, pure water. Gravel, sand, grit, débris will break them down.

The Water-Works Must Own the Meters

Finally, successful operation of a meter department demands that all meters should be owned and installed by the water-works. It is vital to the success of a metered system that the water-works shall determine the make, type, and size of meter to be used on a service, the place and manner of installation, and time for testing and repairs. This can be accomplished only when the meters are owned by the water-works and under its complete control



TESTING EQUIPMENT FOR LARGE METERS

Parking Regulations Are Not Exclusively for the Benefit of Parked Vehicles

A TRUCK more than 18 feet long was parked at an angle of nearly 90 degrees with the curb in a San Diego street. A local ordinance required that vehicles park at an angle of 45 degrees. Sills projecting from the rear end of the truck caught a door of a passing Ford car, breaking the glass and injuring one of the passengers.

Suit against the owner of the truck for damages proceeded upon a theory that the accident was caused by violation of the parking ordinance—that if the truck had been parked at an angle of 45 degrees the sills would not have projected so far into the street and the accident would not have happened. The defendant countered with a contention that the ordinance was for the sole benefit of parked vehicles and that plaintiff was therefore not entitled to avail herself of its benefits . Affirming judgment in favor of plaintiff in the case of Flynn vs. Bledsoe Company, 267 Pac. 887, the California District Court of Appeals said:

"Obstruction to a street is a serious menace to the automobile public and is as great a consideration as could be presented to a city council to induce the enactment of an ordinance which would tend to minimize the obstruction thereof by parked vehicles.

"We cannot shut our eyes to the common knowledge, possessed by every one, that automobile drivers on our crowded city streets must keep close watch of oncoming traffic in order to avoid collision therewith, and we cannot assume that the members of the city council . . . were any less conscious of this necessity than other people, and therefore did not have in mind the safety of the general traveling public when enacting an ordinance which, if complied with, would give the widest possible space usable for moving vehicles."

It is made clear by the Court that if, notwithstanding the unlawful parking, the driver of the Ford car in this case had caused the collision through failing to maintain a proper lookout or to drive properly in driving by the truck, the owner of the truck would not have been liable.

This latter view of the case harmonizes the decision of the California Court with the holding of the Kansas Supreme Court in the case of Haines vs. Carroll, 267 Pac. 986. The suit was based on defendant's fault in permitting his car to stand on the pavement in the nighttime without lights on, a collision resulting. But a majority of the judges of the Supreme Court held that plaintiff's own carelessness was a bar to recovery, because he drove too fast in the darkness. The Court said:

"Plaintiff did not have such control of his car that he could stop or turn out within the vision of his lights in order to avoid the collision and that he was, therefore, as a matter of law, guilty of such contributory negligence as bars his recovery."

A. L. H. STREET.

Any Town That Really Wants a Playground Can Have One—and Equipment, Too

By MARY BENNETT
HARMON FOUNDATION, NEW YORK

ANY town can have a playground. Any town can have almost any equipment it needs for its playground. This has been demonstrated in more than a hundred communities during the past few years, particularly during the past year. Many ingenious ways have been devised for making recreation possible, for enlisting community cooperation, and for improving civic play facilities.

THE OKMULGEE, OKLA., "HOBOES" READY FOR WORK

Here in a Western town, hammers fly and saws shriek as the school children build a stadium. There in an Ohio village, eighty men and boys fill the playground and the evening air with sounds of their participation in kitten ball. In Texas, a field of corn stubble becomes a beauty-spot—not miraculously, but under the muscular impetus of the Lions Club membership. On a shaded Southern playfield, scissors and thread, knife and paint-brush fashion enough gay wares to fill an exhibition hall. Everywhere appear new gridirons, diamonds, courts, and perhaps, on the older-established fields of more sophisticated sections, lily ponds, pergolas, and ornamental archways.

"High School Hoboes" Earn a Playground

One of the most hilarious of all the events reported in the nation-wide efforts toward more and better playgrounds, was also one of the most effective. It was a "Hobo Day," by means of which the school children of Okmulgee, Okla., a town of less than 30,000 population, earned a stadium for their playfield in a single day. This is the advertising appeal which put their idea over, and won the goal. Their medium was their school paper.

"WE WANT TO EARN $1,500;
GIVE US YOUR WORK"

"High School hoboes will accept any kind of work, will guarantee a dollar's worth of service for every dollar paid. We're trying to boost and improve Okmulgee by building the only school-owned athletic field and stadium in the state. We have set our goal at making Harmon field and stadium one of the greatest playgrounds in the country.

"Here are a few things we will do: window washing, gardening, hauling trash, distributing advertising, beating rugs, raking yards, whitewashing trees, washing cars, washing dishes, scrubbing porches, clerking, furnishing music or entertainment for parties; in fact, anything that is work.

"Telephone 3005, 3006, 3007.

"List Your Job and Get a Hobo to Do It.
ALL DAY LONG—FRIDAY, MARCH 30."

On the appointed day, school children swarmed the town with charcoal-blackened eyes and rouged noses, and dressed in hoboes' rags and tatters. With a burlesque king and queen styled "Hobum" and "Hoba," their quartette and their band, they opened their day's program of work in campaign style. They carried the townspeople with them by the sincerity of the spirit they put into their tasks, and thus put the project over. Incidentally, they sacrificed their trip to an interscholastic meet in which they usually win many prizes and honors.

A New Stunt for the Gym Class

In Hillyard, Wash., the students of the manual arts and physical education classes actually built bleachers and field houses and golf courses, and seeded the grounds. A local newspaper reports the novel construction trick they used in carving out the sand greens for the course, equipped with a section of heavy-duty railroad tie, a length of inch rope, a 6-ton field roller, and "two hundred strong backs."

"Anchoring one end of a rail section at the pin, boys of the gym classes hitched themselves to the opposite end and circled, one boy riding, until a perfectly level green was cut out. Sand was then hauled on and the whole oiled with transmission oil obtained from a

HILLYARD, WASH., HIGH SCHOOL MANUAL TRAINING BOYS BUILDING BLEACHERS ON HARMON FIELD

QUOIT PITCHING AFTER WORKING HOURS, BICKNELL, IND.

nearby garage. As a final step, a 6-ton roller was hauled over the green."

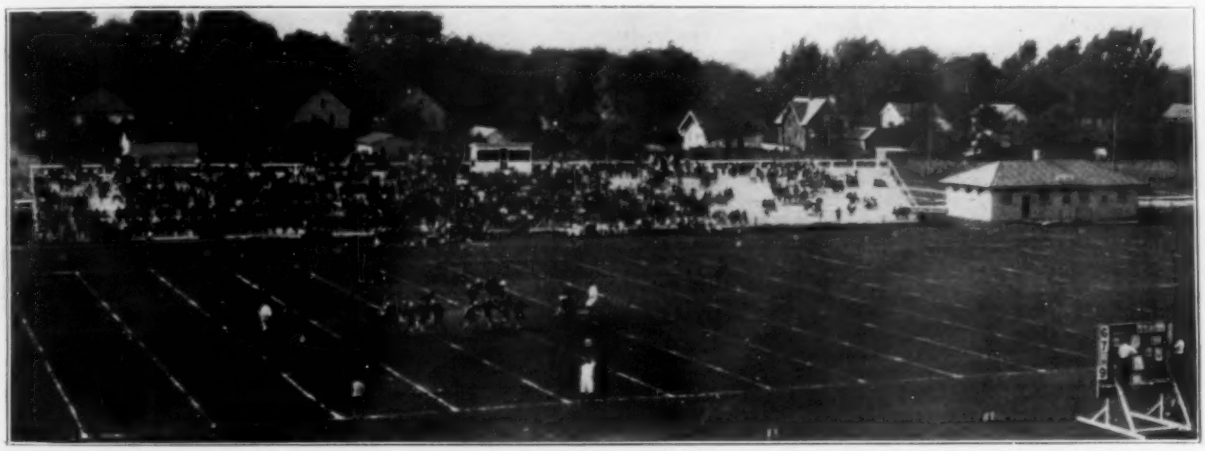
Paragould, Ark., was very ingenious in securing a cinder track. The Missouri Pacific Railroad offered cinders; every truck and dray owner in the city was invited to move one load; and the high school boys were on hand to spread the cinders as well as to help load and unload them. On another occasion, a motor company conducted a demonstration of one of its farming machines and broke up the entire front of the park proper, in preparation for its being transformed into a lawn. In the same community the salary of a playground supervisor was saved by members of the Business and Professional Women's Club taking turns in being on duty at the field.

In Bicknell, Ind., a motor sales company lent some of its equipment for grading the grounds. The state highway crew donated a day's work at Paulding, Ohio, in grading and leveling the field. In the same town was inaugurated the custom of planting memorial trees on the playground to commemorate someone who had died, or for a child's birthday. In Talladega, Ala., the American Legion held a memorial tree planting service. An Arbor Day picnic was used by Worthington, Minn., as a means of starting a beautification program, all those having suitable trees and shrubs being urged to donate them for the ceremonial public planting. In the same town, a truck load of bird-houses was obtained for the playing field by means of a contest.

Membership with Privileges

A businesslike way of solving the expense problem was adopted by the sponsors of the field at Souderton, Pa. A Playground Association was formed with a yearly membership fee of $5. This entitled members to all privileges of the field and at the same time practically solved the finance problem. Children were not charged for the use of the field, and it was easy to obtain other members when it was pointed out that with the small yearly fee there went the following privileges:

Free instruction in swimming
The use of the pool 12 months of the year
Use of the tennis courts
Use of croquet courts
Use of archery lane



A FOOTBALL GAME IN PROGRESS AT HARMON FIELD IN FREMONT, OHIO

THE ARTISTIC GATEWAY TO HARMON FIELD AT WORTHINGTON, MINN.

Use of regulation horseshoe and ring quoits
Use of hand-ball courts
Use of playground and equipment, including volley-ball, basket-ball, etc.

All these communities competed in the 1928 Affiliated Playground Contest of the Harmon Foundation of New York, which has sponsored over a hundred playfields in every part of the country, and which conducts annual competitions for progress in the improvement of these fields. Thirty-nine awards were made, ranging from a first prize of $500 down to 21 prizes of $50 each. Almost every conceivable kind of organization backed the playground improvement programs in the various communities—the American Legion, Lions Club, Rotary, Kiwanis, Women's Clubs, Chamber of Commerce, City Council, School Board, high schools, Boy and Girl Scout organizations, and Camp Fire Girls, literary societies, parent-teacher associations, and churches.

One indirect result of any such contest is always the widespread publicity accruing to the playground movement as a whole. In the case of the Foundation's recent competition, this publicity was increased by the unusual requirement that all evidence of progress be submitted in the form of newspaper clippings and photographs. Awards were based on improved equipment, organized leadership, and all-round successful use of the field, *as indicated in print and pictures.* The result was that the playground sponsors made use of news items, editorials, features, annual reports, letters to the newspapers, handbills, posters, pictures, and the like to tell their progress stories.

The Prize Winner

The first prize was won by Fremont, Ohio, a town of 14,000. The playground also serves as the athletic grounds for the local high school, so that the resources of the School Board are added to those of the Federated Women's Clubs and the Kiwanis Club. A new field house, fence, gate, cinder track, and baseball diamond cost the community about $7,000—an unusually high expenditure. But it was not the amount that won the prize. Rather, it was the spirit of community cooperation as evidenced in the publicity and photographs submitted. The track, costing $3,200, was paid for out of the proceeds of a huge Thanksgiving football game and a magazine subscription contest carried on by the school children, which netted $630—the best record which any high school in the United States made competing under the plan.

An account of a gala day planned at the field is typical of the spirit behind this playground. The Ohio Power Company aided in stringing the field with lights; the high school band tendered its services; all of the material to be sold at the field was donated by the citizens or sold at a reduction by the merchants. Said the local paper in anticipation of the affair:

"Among the necessities for the benefit will be, first, your services. At least 20 men are needed and plenty of women.

"For the supper will be required meat loaf, potato salad, escalloped potatoes, vegetable salads of any kind, baked beans, wieners, hamburg steak, cakes, pies, or any other dishes suitable for a cafeteria supper. Cash will also be required for the purchase of ice cream. . . . Decide at once what your contribution will be and . . . telephone the Woman's Club."

Refreshment stands operated by school students, Boy Scouts, or Campfire Girls, helped to swell many a playground treasury. Benefit ball games, band concerts, frolics, and home talent and professional shows of all kinds were frequently reported.

The 39 prize-winning towns in 20 states are as follows:

Fremont, Ohio	$500	Bicknell, Ind.	$200
Paragould, Ark.	400	Bluffton, Ohio	200
Kearney, Nebr.	350	Decatur, Texas	200
Hillyard, Wash.	300	Lebanon, Ohio	150

$100 EACH TO

Talladega, Ala.	Paulding, Ohio
Fayetteville, Ark.	Wauseon, Ohio
Coffeyville, Kans.	Wellsville, Ohio
Houma, La.	Okmulgee, Okla.
Bellefontaine, Ohio	

Worthington, Minn., $75

$50 EACH TO

Eureka Springs, Ark.	Miamisburg, Ohio
Stuttgart, Ark.	Sidney, Ohio
Alamosa, Colo.	Wapakoneta, Ohio
Fort Lauderdale, Fla.	Lawton, Okla.
Canton, Ga.	Waurika, Okla.
Mayfield, Ky.	Bend, Ore.
Sturgis, Mich.	Vernonia, Ore.
Herkimer, N. Y.	Souderton, Pa.
Oneida, N. Y.	Martin, Tenn.
Tryon, N. C.	Stamford, Texas
Granville, Ohio	

This Year's Competition

Such interest and enthusiasm as were shown during the past year are of course, infinitely encouraging, so much so that the Harmon Foundation has again announced its group of honoraria, this time to be awarded for work in beautification and improvement done in the 16½-month period beginning May 1, 1928, and ending September 15, 1929.

This competition is open to all affiliated Harmon Fields. About twenty new playgrounds are eligible to enter the contest this year, these being created under the Harmon awards to real estate operators. Under the terms of this offer, made in 1928, $40,000 was set aside to aid operators who, in opening new subdivisions, made provision for permanent play space. Nine awards have already been made from this fund, aiding subdividers in setting aside playgrounds in the following communities: Westwood, N. J.; Lorain, Ohio; Rockford and Monmouth, Ill.; Morgantown, W. Va.; Mishawaka, Ind.; Battle Creek, Mich.; Fort Worth, Texas, and Conshohocken, Pa.

The total amount to be given in honoraria in 1928-29, $5,000, has been tentatively apportioned into 31 awards as follows:

First award	$750	Three awards of	$200
Second award	500	Five awards of	150
Third award	400	Seven awards of	100
Fourth award	300	Ten awards of	50
Two awards of	250		

These sums, however, are not necessarily representative of the final distribution. The Foundation reserves the right to make such changes as may be warranted by the character of the material submitted.

Once again, this year, the judges are to make their decisions on the basis of photographs and clippings of actual playground publicity. It is felt that this method has now been proved to be the best way of watching progress and at the same time keeping the playground project before the attention of the local public.

Ten "Nevers" for the City Manager

C. H. R. FULLER, City Manager, Chatham, Ont., in concluding a recent address given before the Canadian Union of Municipalities and published in the *Municipal Review of Canada* (September, 1928), quoted ten points of policy for the city manager. Since these ten negative commandments involve so much that makes for the success and popularity of any city manager, it does not seem amiss to reprint them here:

"1. Never turn a citizen down on a request without a good reason.

"2. Never try to be final arbiter on questions that can be appealed to the council.

"3. Never go to the mat on small things.

"4. Never refuse personally to inspect some complaint made by an irate citizen.

"5. Never fail to recognize the other man's viewpoint in all matters of policy and public service when there is a difference of opinion, nor be arbitary, assuming the role of the dictator.

"6. Never have the tendency to advertise yourself instead of the service.

"7. Never fail to give proper credit to the council and the men in the departments.

"8. Never have a tendency to blow hard about the accomplishments of the administration.

"9. Never use your knowledge of, or influence in, city affairs to further your own personal interests.

"10. Never attempt to influence strenuously the council in their legislative functions."

The North Toronto Activated Sludge Sewage Treatment Plant

By HARRISON P. EDDY
METCALF & EDDY, ENGINEERS, BOSTON, MASS.

A HIGH degree of purification is required in the sewage treatment plant now under construction by the city of Toronto, Ontario, to serve a population of 50,000 persons in the North Toronto district. The plant effluent will discharge to the Don River, the flow of which during the summer months probably does not exceed that of the ultimate discharge of sewage from the district. Public parks are situated along the stream below the plant, and the river discharges into Toronto Bay, which is a nearly land-locked body of water connecting with Lake Ontario. Pollution of the lake water should not be increased.

The sewerage system of the district is on the combined plan, admitting both storm water and sewage. The treatment plant is designed to provide complete treatment of sewage and storm flow up to twice the ordinary dry-weather flow, and to remove sewage solids capable of settling in the river, from the excess storm flows. The ordinary dry-weather flow is estimated at six million gallons (U. S.) per day, and the maximum storm flow at 1,430 cubic feet per second, the capacity of the main trunk sewer.

The treatment plant comprises the following principal features:

1. Racks to retain large objects carried by the sewage
2. Grit chambers for the removal of any sand or similar heavy mineral matter
3. Preliminary sedimentation tanks for the removal of coarser suspended solids
4. Aeration tanks and final sedimentation tanks for the activated sludge process, to bring about the further purification of the sewage
5. Separate covered tanks for the digestion of the sludge with the aid of artificial heat and possibly conditioning chemicals
6. Glass-housed underdrained sand beds for the drying of the digested sludge
7. Standby tank for the treatment by sedimentation of storm flows in excess of those which can be given complete treatment

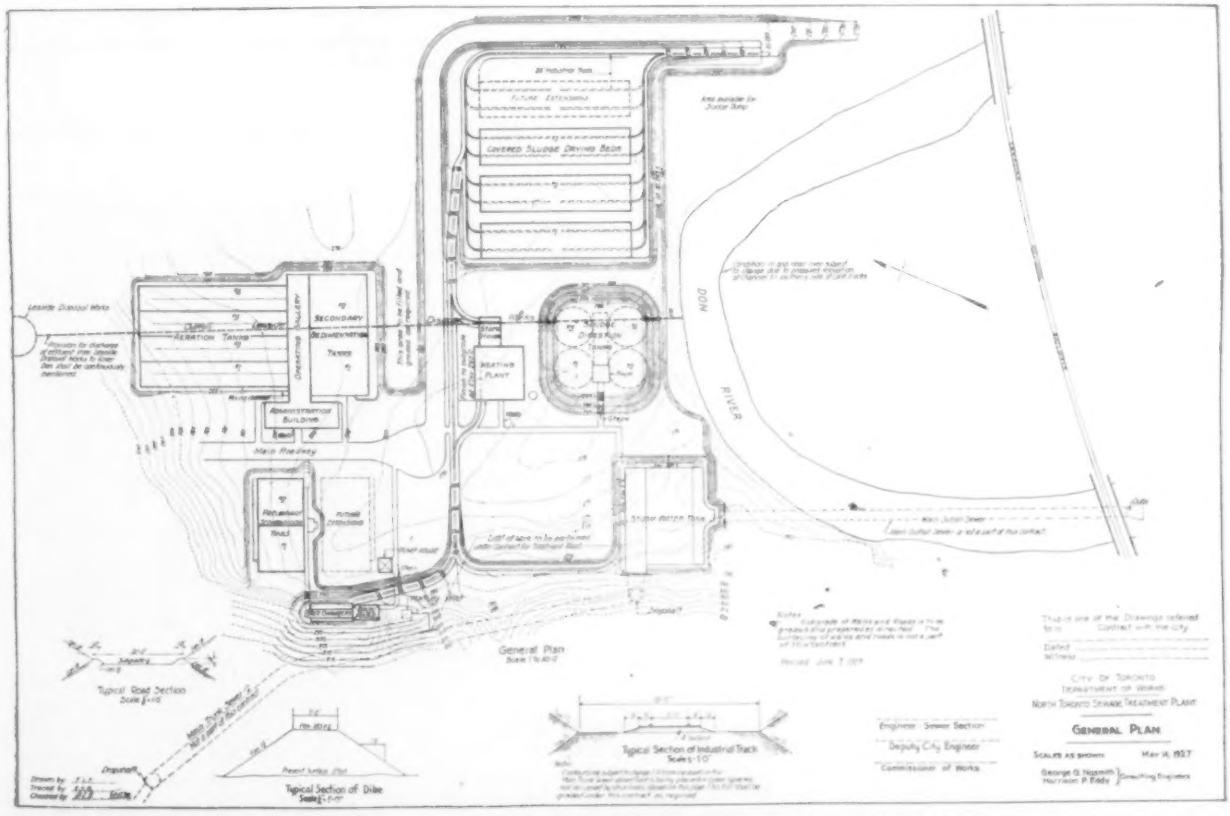
This process of treatment will remove from the sewage practically all of the suspended matter, turbidity and color, and upwards of 95 per cent of the bacteria.

Venturi Meter Rate Controller

Flow to the sewage treatment plant from the combined sewer will be limited to a maximum of 12 million gallons per day by a venturi meter rate controller which automatically operates a gate to exclude excess storm flows and in addition registers and records the rate of flow through the plant.

Racks

After passing through the venturi meter, the flow will be passed through racks consisting of parallel bars with 2-inch clear openings for the removal of large objects which might cause difficulties in subsequent operation. The relatively small amount of material removed by the racks will be burned, buried or otherwise disposed of in a sanitary manner. A building is provided to house the



GENERAL PLAN OF THE NEW NORTH TORONTO SEWAGE TREATMENT PLANT

racks and the venturi meter rate controller, register and recorder.

Grit Chambers

The sewage will then pass through grit chambers, two of which are provided, each 3 feet wide and 45 feet long. The grit chambers are in the form of channels, designed to reduce the velocity of flow to about 1 foot per second, at which rate sand or similar material in the storm-water run-off will be deposited. The material deposited will be drained and used for filling in low areas near the plant. The object of removing the grit is to prevent subsequent difficulties in handling the sludge and interference with sludge digestion.

Preliminary Sedimentation Tanks

From the grit chambers the sewage will flow to the preliminary sedimentation tanks, of which there are two units each 50 feet square and about 13 feet 6 inches deep, providing a theoretical detention period of about 1½ hours at average dry-weather flow. These tanks are equipped with sludge plows for forcing the sludge to a central cone from which it may be removed while the tanks are in service. This sludge, together with the excess activated sludge, will be heated and conditioned as required, and pumped to separate sludge digestion tanks. The object of the preliminary sedimentation tanks is to remove the solids likely to cause trouble in the aeration tanks and to lighten the load on the activated sludge plant.

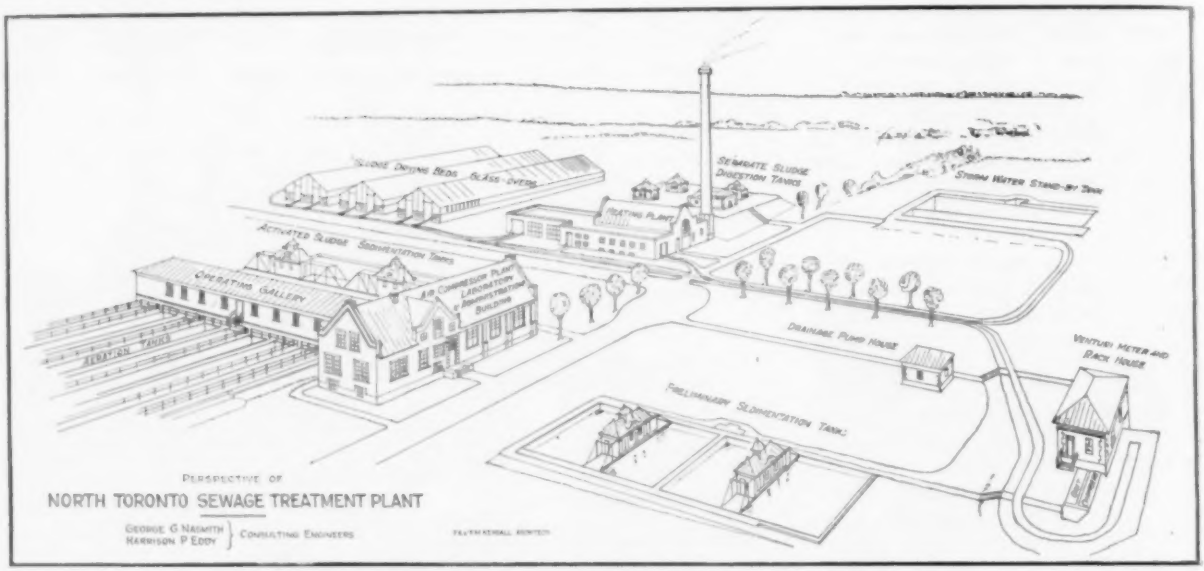
Aeration Tanks

The effluent from the preliminary sedimentation tanks will be mixed with about 25 per cent of activated sludge returned from the activated sludge sedimentation tanks, and will then pass through aeration tanks. A short period for mixing the sewage and activated sludge prior to discharge to the aeration tanks will be provided in a mixing channel. Four aeration tanks are provided, 10 feet 6 inches deep, with a total water capacity of 166,700 cubic feet and a theoretical detention period of about 4 hours at average dry-weather flow. The tanks are divided into two channels, each 13 feet wide and 163 feet long. Air diffuser plates are arranged along one side of the bottom of the channels. The channels are baffled at the top, and the corners at the bottom filled in so as to facilitate spiral circulation set up by the introduction of air beneath the diffuser plates. It is estimated that 1 cubic foot of air per gallon of sewage treated will be required.

The air accomplishes the dual object of aeration and agitation of the mixture of sewage and activated sludge. The activated sludge is composed of sewage solids rendered bacterially active by aeration. The presence of oxygen is necessary to maintain the sludge solids in a bacterially active state. The activated sludge, which is in sponge-like masses, absorbs the suspended and colloidal matters in the sewage and partially oxidizes the organic matter of the liquid portion, rendering it non-putrescible. The activated sludge treatment will also remove a very large proportion of the bacteria in the sewage.

Final Sedimentation Tanks

From the aeration tanks the mixture of sewage and activated sludge will flow to two activated sludge sedimentation tanks, where the sludge will be deposited and from which the final effluent will flow to the Don River. These sedimentation tanks are 65 feet square and about 15 feet deep and will afford a detention period of about 2 hours, at average dry-weather flow. The final effluent will be practically clear, colorless and odorless, and will be stable. The tanks are equipped with sludge plows for scraping the sludge to the central cones for continuous removal, the desired amount being added to the effluent of the preliminary sedimentation tanks at the mixing channel and the excess discharged into the sludge digestion tanks with the sludge from the preliminary sedimentation tanks.



PERSPECTIVE OF THE NORTH TORONTO SEWAGE TREATMENT PLANT

Separate Sludge Digestion Tanks

By the process of bacterial digestion, under favorable conditions, sewage sludge is rendered inoffensive and may be dewatered readily and inoffensively on sludge beds of porous material. In this process a portion of the organic matter is converted into combustible gas, largely methane. It has been established, by research and in practice, that sludge digestion proceeds rapidly at summer temperatures, and that the control of the reaction of the sludge is important to further speed up the rate of digestion.

There are four digestion tanks about 27 feet deep and 40 feet in diameter providing a total of 100,000 cubic feet storage capacity estimated as adequate for two months' storage of the sludge from the preliminary and final sedimentation tanks. The tanks are roofed and covered with earth so as to prevent radiation of heat as far as practicable. The sludge pumped to, or recirculated from, the digestion tanks will be heated

sufficiently to maintain a temperature of at least 70° F. in the tanks. The tanks are provided with mechanical equipment for stirring up the sludge, if and when this appears to be necessary, to promote digestion and to facilitate the withdrawal of digested sludge. Provision is also made for circulation of the sludge for heating or conditioning purposes or for the transference of the sludge from one tank to another.

The gas given off by the processes of digestion will be collected and burned under steam boilers and the steam utilized for maintaining a favorable temperature for sludge digestion and drying. The gas will be burned in a special gas incinerator when heat is not required about the plant. The collection and burning of the gas will preclude the possibility of offensive odors escaping from the sludge digestion tanks.

Glass-Housed Sludge-Drying Beds

After digestion, the sludge will be drawn off and dried on glass-housed sludge-drying beds. Three glass houses, each about 40 feet wide and 160 feet long, have been provided, each house enclosing four sludge beds about 20 feet wide by 80 feet long. The drying of sludge will not be interfered with by rain or snow, as is the case with open beds. The houses will be heated in excessively cold weather to prevent freezing of the sludge.

After the draining and drying for two or three weeks, the sludge will be removed from the beds, using industrial track and cars, and a gasoline locomotive for transportation to low areas within the plant site. This sludge will have some fertilizing value, and it is probable that there will be a demand for it in the neighborhood of Toronto.

Storm-Water Standby Tank

A storm-water standby tank is provided for treating all flows which do not pass through the sewage treatment plant. The tank is rectangular in shape, 70 feet long by 103 feet wide, and with an average depth of 10 feet. The water capacity is about 66,700 cubic feet. The purpose of this tank is to settle out grit and sewage solids capable of settling in the river, and it will provide as much treatment for storm flows as is justified. The detritus will be flushed over with a monitor, and the supernatant liquor and organic solids returned to the influent of the grit chambers by pumping. The grit will be excavated with a clamshell bucket operated from a gantry crane, and transported to the sludge dump by means of the industrial railway system.

Air-Compressor Plant

To furnish air for the aeration process, three reciprocating compressors, each with a capacity of 2,500 cubic feet of air per minute at 6 pounds pressure have been provided. These are driven by 100-hp. motors. Dust and other foreign matter which might clog the diffuser plates in the aeration tank are removed by passing the air through an air filter.

General Plant

An administration building is provided, housing a laboratory, machine shop and men's locker room. The compressor plant is located at one end of this building. A covered operating gallery, housing air-, sewage-, and sludge-control valves and meters, extends between the aeration tanks and connects to the administration building.

A central heating plant is provided, equipped with coal- and gas-fired boilers. Heating mains extend to the administration building and activated sludge operating gallery, the glass houses over the sludge beds, and the digestion tank operating gallery. Equipment for heating, conditioning and pumping sludge is housed within the heating plant.

The storm-water, grit chamber and other structures are drained to a main drainage pump-house, where two electrically driven and automatically operated, float-controlled, vertical, centrifugal pumps of the non-clog type are provided to return the drainage to the treatment plant influent channel.

The estimated cost of the treatment plant, excluding engineering, based on contracts, is $650,000.

Personnel

The preliminary report and contract plans and specifications for the North Toronto sewage treatment plant were prepared and presented by Dr. George G. Nasmith, of the firm of Gore, Nasmith & Storrie, and the writer, of the firm of Metcalf & Eddy. The plant is under construction by the firm of Kilmer & Barber, Ltd., Toronto, under supervision of the Department of Works, R. C. Harris, Commissioner, and G. A. McCarthy, Engineer of Sewer Division. It is expected that the plant will be placed in operation early this year.

Helping Subdividers to Adapt Street Widths to Street Needs

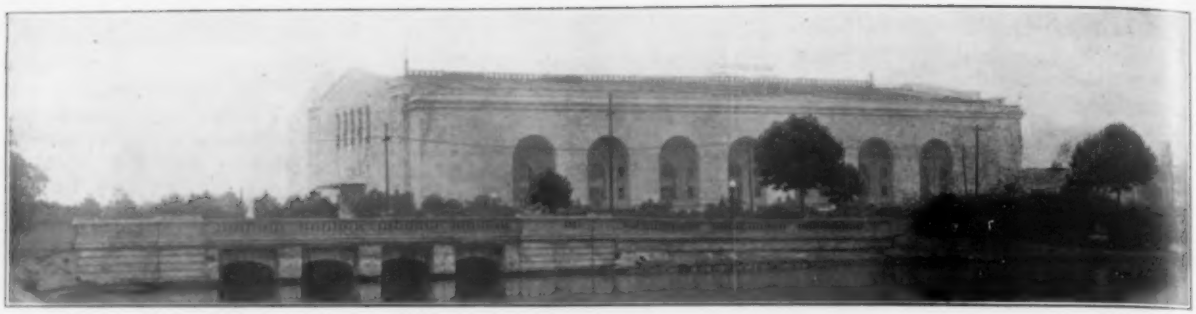
THE folly of requiring uniform widths of streets in the development of residential districts is emphasized in the report on Population, Land Values and Government, a 1929 publication of the Regional Plan of New York and Its Environs. Under the heading of "Unguided Growth," the report says:

"The kind of community pattern which results from unguided growth is largely the independent work of the subdividers of privately owned acreage. The business of retailing land in lots produces and fixes the pattern as an incidental by-product. This business is conducted by men who are thinking first of all about the immediate dollar return. Although most of them would, for reasons of good business policy, be glad to shape their plans so as to conform to the community's wishes and take advantage of probable trends in local development, they must ordinarily proceed without advice or guidance. This is not the fault of the developers, but of the community in not having a plan and satisfactory building code as a guide to both itself and the developers. On the other hand, where there is no community plan, a developer who would like to do what would be for the interest of the community is often cramped by the presence of obstacles that would, in the light of a plan, have been removed by the community.

"Consider the matter of street patterns and street widths. It is essential to have regard to the proportion of subdivided area that has to be allotted to streets, for streets are a first charge on the lots. It is probably sufficient to devote 25 to 33⅓ per cent of an area for all streets, but to have an average percentage that will be efficient it is necessary that each street be designed for its appropriate use in relation to the character of building development. This would mean that parts of the area where main thoroughfares are required would have a higher percentage of the area devoted to wide thoroughfares, and that parts occupied by single-family residences under a strict zoning ordinance would have a lower percentage of the area in rather narrow streets. Unless the residential streets are kept narrow, it is expensive and difficult for the taxpayers to provide adequate width for the streets required to serve through traffic and more intensive building.

"Now, where there is no city or village plan to control development in accordance with a well-conceived scheme and adequate zoning restrictions, subdividers have to make streets conform to a uniform rule regarding their width. This results in most streets being unreasonably wide because they have no regard to differences in the types of building development that are to be anticipated at different spots and to the many variations in street use. The result is that the street patterns in single-family residence neighborhoods are the same as those in apartment house neighborhoods and business districts. This is burdensome to residence districts, discouraging to business districts, costly for the town and wasteful of its potentialities. Furthermore, when most streets are too wide for purposes of single-family residence, the owners of lots in such neighborhoods are placed under an artificial inducement to build up or otherwise convert their land to more intense uses.

"The effect of a poorly planned street system is to depress values of land in both residential and business areas."



MUNICIPAL AUDITORIUM IN OAKLAND, CALIF.

Three Municipal Auditoriums of Varied Financial Success and Community Usefulness

THE extent to which a great municipal auditorium may figure in the cultural no less than in the recreational life of a community has been demonstrated in Oakland, Calif., where the Chicago Opera Company this year conducter a very successful season of opera in the great arena, which seats 9,000 people; reservation has been made for its use by the same organization in March, 1929.

This splendid building, erected twelve years ago at an initial cost of $1,500,000, contains an up-to-date theater with a seating capacity of nearly 2,000, which is increasingly in demand for high-grade dramatic entertainments and concerts. Uses made of the art gallery further refute criticisms originally made that the building would prove a "white elephant" on the hands of the taxpayers. And the auditorium is not only a center of entertainment for the entire city but, by reason of its excellent exposition facilities, has also become the center for such important livestock events as the National Horse Show, the Pacific Slope Dairy Show, and the California State Poultry Show.

According to recent statements made by Frank Colbourn, Commissioner of Public Works, under whose management it is operated, the municipal auditorium is now almost self-supporting.

Another California city, Visalia, according to a report recently issued by City Manager B. J. Pardee, has an up-to-date, well-equipped municipal auditoruim which is a veritable white elephant in the city's financial affairs—and otherwise as well. It is proving, in fact, "a nuisance in more ways than one," according to Mr. Pardee's statement, which points the moral that a recreational center should be shaped according to local needs and local ability to support it. The statement follows:

"The total rent collected for use of the municipal auditorium for the fiscal year 1926-1927 was but $575, whereas the operating cost was $3,928. The bond redemption and interest charges amount to an additional $2,000 per year, with a balance of $28,000 bonded indebtedness still outstanding at 6 per cent. This makes the municipal auditorium of Visalia cost the taxpayers nearly $7,000 per year.

A more recently completed auditorium is that of Wichita Falls, Texas, which serves a variety of purposes in the community life, and is a source of civic pride, although it is far from self-supporting. According to information recevied from W. E. McBroom, City Clerk, the structure is a combined Municipal Office Building and Auditorium dedicated to the memory of those who died in the World War. It was planned to cost $500,000, but when finished in November, 1927, the total cost was $625,000, made up of $531,975 for the three-story brick and reinforced concrete building, $34,995.50 for improving the site (land donated), and $57,119.50 for equipment.

The auditorium has a seating capacity of 4,000, a 40-ft. x. 80-ft. stage, fully equipped, and a large number of dressing rooms. The acoustics are perfect. An organ grill has been provided and adequate funds for the organ itself are hoped for in the near future.

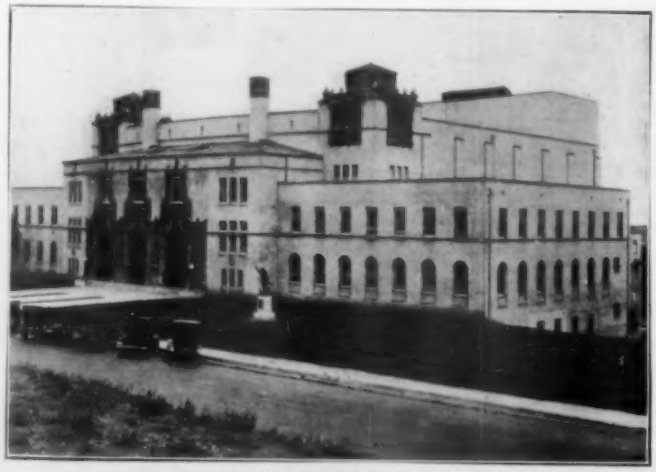
The office space on the first floor houses without charge such civic organizations as the Boy Scouts, Red Cross, Camp Fire Girls, Family Relief Association, Executive Secretary of the Community Chest and the American Legion and Spanish War Veterans. Four units of the Texas National Guard are also taken care of in the basement, which was originally designed for a public market. All executive offices of the city administration are located in the second and third stories of the office portion. The Fire and Police Departments occupy a separate building in the down-town area, built 20 years ago for a City Hall and Fire Station.

The auditorium revenue has amounted to $4,389.50 during the first year's operation. This income has been derived from rentals for 34 events, including two grand operas, six concerts, eight political speeches, two religious lectures, two conventions, four road shows, two cooking schools and two home-talent shows. Revenue from rental of other space, etc., made the total for the first year $6,154.21. This revenue applied against the total operation expense of $12,579.29 leaves a balance to be paid from general taxation of $6,425.08 in addition to $46,254.17 for annual principal and interest payments.

Below is a detailed analysis of the cost of the first year's operation:

	Cost Per Year	Per Capita
Interest	$29,687.50	$.49
Principal	16,566.67	.28
Salaries	5,880.00	.10
Insurance	3,295.57	.05
Supplies	1,234.32	.025
Electricity	1,278.72	.025
Natural gas	835.00	.014
Water	55.68	.008
Total cost	$58,833.46	$.992
Revenue	$6,154.21	$.102
Net cost	$52,679.25	$.890

Mr. McBroom states that the city officials would not recommend the construction of a similar large public auditorium to any city under 60,000 population or with an assessed valuation less than $50,000,000.



THE WICHITA FALLS, TEXAS, AUDITORIUM

The Airport and the City Plan

The First Chance That History Has Offered to Apply the Modern Principle of Prevention to a New Art and Science in a Big Way

By GEORGE B. FORD

IN former times the gateway to the city was a portal in the city wall—narrow, gloomy, tortuous, anything but hospitable.

Yesterday the city gateway was the great railway terminal—a vast cavern, murky, confusing.

The gateway of tomorrow is the city airport—open, bright, welcoming.

The First View of the City

As one approaches the surviving walled city—austere and forbidding with its occasional tower or dome appearing above the ramparts, there is a sense of mystery which entices the visitor to explore within.

By contrast, in the railway entrance to the average city, often through miles of unkempt factories or squalid tenements, the city seeming to turn its back on the visitor, all is baldness and ugliness.

In approaching by water, any unkemptness or ugliness is merged into an often striking silhouette that the city assumes. However, at best, the water view presents only a small segment of the city at a time.

It is in the approach by air that the city stands out in all its fascination. It is a great map come to life, an intricate pattern, a vivid mosaic of form and color, light and shade.

It is unfortunately true that this mosaic—intriguing as it may be—usually appears to be just a formless mass, a meaningless jumble, without plan or reason. By contrast, a Paris or a Washington stands out in all its glory and beauty as a triumph of ordered pattern. We have never been able to see the plans of our cities before, and so we have never had a chance to see how formless we have let them become. In our air travel of the near future we are going to be all too conscious of our dereliction. It is this thought that has inspired the German Government to have architects and city planners study the appearance of cities and towns from the air.

Airport Aspect

If the airport in its layout satisfies all of its practical requirements, the problem is even then only half met, for unless the design of the airport itself, as seen from the air, satisfies the eye, a great opportunity has been missed. Secretary Davis and the War Department have been the first to recognize this, and in the plans which we have recently made for Mitchel, Selfridge, Albrook, March, Rockwell and Randolph Fields, we have attempted to make the general layout a good composition in form and color and a delightful place to live in as well as technically efficient.

Municipal Airports of Today and of Tomorrow

This paper by Mr. Ford was among those read at the airport conference held at the Grand Central Palace in New York City on the opening day of the New York Aviation Show, last month. The author, who discusses the present municipal airport and visualizes that of the future, is affiliated with the Technical Advisory Corporation, of New York, and is city planning consultant to the War Department and to many municipalities. Other speakers at the conference included Harry H. Blee, Chief of the Airport Section of the Aeronautics Branch, U. S. Department of Commerce; Archibald Black, airport consultant; and Colonel Stedman S. Hanks, President of the American Airports Corporation. The Aviation Show, which was the first of its kind held in New York City in seven years, drew thousands of aviation enthusiasts and officials, many of whom attended the airport conference.

In Europe they have gone even further and attempted to make the airport gay—a place of resort, with the introduction of clubs, cafés, restaurants and hotels. At the Templehof field in Berlin they are even encouraging the public to come there for dances and entertainments. They believe that it encourages air-mindedness.

Again, we can profit by the horrible example of the railroad station and avoid the sordid surroundings of the latter by placing the airport in a residence district or, better still, adjoining a park, golf course, fair ground or other public reservation. This location would have the added advantage of facilitating the control of tall buildings or chimneys in the neighborhood of the field, with the menace they present to rising planes. Of course it is claimed, not without justice, that the noise of an airfield disturbs nearby homes. However, with the rapid improvement of muffling devices, this nuisance will probably soon be abated.

It is not inconceivable that the typical larger airport of the future will be a hub of buildings in the center of a surrounding landing field, with vehicles approaching the island service buildings through a tunnel under the field. A pioneer plan of this sort has been adopted for Rockwell Field—the great Army training center. It has proved capable of developing into an exceptionally interesting layout.

Roof Advertising

Also, with a view to assuring attractive surroundings, every municipality should immediately prohibit all roof advertising. Roadside advertising grew with amazing rapidity and without check until it was too late. Now we are going to an immense amount of trouble to restore our roadsides to their natural beauty. Today we have the opportunity to nip in the bud the inevitable spread of roof advertising. It can be forestalled now without loss to anyone. Tomorrow it will be too late and our unique opportunity will be gone.

Airport Approaches

The relation between the airport and the adjacent cities or towns is the outstanding city planning problem presented by aviation. As long as the airplane continues a novelty, greater and greater crowds are going to flock there. In fact, it is maintained that there must be five acres of parking space adjacent to the airport for every hundred planes that use it. One has only to witness the hundreds of cars parked near Curtis Field any fair Sunday to realize the important planning problem which the airport presents. As the novelty wears off, the sightseers will be replaced by the regular users of the airport, so that at best, ample approaches by road, by rail and often by water must be provided. We must not repeat again the costly mistakes we have so often made by inadequate approaches to our railroad stations. Speed by road transit or rail from the airport to the city center is the great essential, even though it may mean construction of an express super-

highway between the two points.

Unquestionably, too, passenger and freight rail approaches are going to be of the utmost importance within a few years; so much so that it has been suggested that an ideal place for a future airport for New York would be on a great raised platform over a Manhattan Transfer Station, or even over the Pennsylvania cut, just west of the Manhattan Post Office.

Airport Location

Obviously, the airport has to be on the outskirts if land is to be acquired at a reasonable figure. As a rule, they vary from three to twelve miles from the city center. The tendency, however, is toward the creation of an express passenger and mail smaller field nearer the city center, with a large rail or water merchandise transfer center well outside.

To avoid the smoke pall of the city and particularly of its industry, the airport should be, in principle, to the windward of the city. As a general rule, the newer residence sections tend to develop to windward for the same reason, all of which helps the airport by the possibilities it presents of avoiding high buildings and the treacherous air currents that one is apt to find near the tall buildings or an industrial section.

If there happens to be an undeveloped plateau to windward, the possibility of finding a good site for an airport would be further improved, for there would probably be much less fog and swampy soil in such a location.

In any case, the airport should be so located as to make it possible for the approaching airways to avoid passing over the city, with the gustiness and danger which it induces. Then, too, realizing that emergency landing fields as now required at intervals of only 30 miles is still far from safe, it is not inconceivable that the airway of the future will have an emergency field every few miles, or, better still, that the ground under the airway will be maintained free of structures, especially in the neighborhood of cities, so that an emergency landing can be made anywhere. Perhaps it would be possible for these airways to be used as golf courses or public reservations.

One of the most serious dangers of all that the airport may impose on the city plan is the possibility that it may become a barrier to growth, killing the normal residential development of the region beyond it. This menace can be avoided, however, by proper planning of the bounding thoroughfares and a careful determination of the shape of the field in relation to its surroundings.

A System of Airways and Airfields

The Philadelphia Regional Plan has already developed an eventual interlocking system of 30 or more airports, airfields, emergency landing fields and airways as a part of the general regional plan. So few tracts are naturally adapted to airplane use that they should be set apart for this purpose at the earliest possible moment, for once they pass into the hands of the subdivider their cost becomes prohibitive. Westchester County, N. Y., is doing the same thing on a smaller scale, with its five or six airfield sites so distributed over the county that no one will have to motor more than a half-hour to reach one.

The Airport of the Future

With the astonishing development of aviation that we are bound to see within the next few years, the airport is going to assume a place in our life even more important than the railroad terminal does today. Staring at us is the nightmare of this railway terminal, with its cramped approaches, with its often ugly or even sordid surroundings, with its murk and its confusions redeemable only at great cost. So far, our several hundred airports and our several thousand airfields in the United States are just great open spaces with a few purely utilitarian buildings strung along in a line. Almost no attempt has been made at evolving an eventual layout plan. Little thought has been given to appearance.

Fortunately, little or nothing has been done as yet to preclude an attractive, as well as practical, eventual layout. It is a unique opportunity that presents itself today—the first chance that history has offered to apply the modern principle of prevention to a new art and science in a big way; an application which should pay a hundredfold on the investment. Yes, it is the first impression of the city that counts. Let's make that first impression one which will be to the lasting glory and honor of the city.

Aerial Mapping Aids County Planning

WAYS in which aerial maps may be used to advantage in county planning work were outlined by Stanley Abel, Supervisor of the Fourth District, Kern County, Calif., in a paper read before the American Road Builders' Association convention in Cleveland last month.

Such maps are especially helpful in county planning for studies listed by Mr. Abel as follows: highway location and relocation; transportation studies; reappraisal for taxation; subdivision control; probable directional trend of improvements; forest and grain fire prevention. In practically every instance, the work involved in perfecting the aerial map is considerably less than the ground work which would be required to produce the same results, he pointed out. In addition, cost data compiled in the mapping of certain municipalities indicate that the cost of aerial maps is approximately one-fifth that of maps prepared by conventional methods for the same purposes.

"Aerial maps have distinct advantages over the best detailed line maps of cultured areas in that they show the entire area in complete detail, depicting every building, tree, pavement and structure to scale," Mr. Abel said. "The quick delivery of aerial maps sometimes enables the user to begin important work and studies weeks, or months, ahead of the time which would be possible if surface surveys had to be made and maps drawn. An aerial survey of an extensive area can be completed in a matter of months instead of a period of years, as in the case of a ground survey. An important feature also is the fact that the layman is competent to read the maps as well as the trained engineer."

Giving an example in one of these fields, Mr. Abel mentioned the problem often created when the county plan emphasizes the need for a new connecting link between two cities or points of importance, the intervening area being composed of lands and property sufficiently improved to make haphazard or arbitrary location of highways an expensive proposition. In such a case, he declared, the aerial map, by showing cultural conditions for a considerable distance on either side of the tentative line, gives information that would be impossible to obtain otherwise and saves many right-of-way difficulties, etc.

"Many of our county roads are located along section lines and are a series of right-angle jogs which not only increase the danger element of ordinary driving, but also serve to greatly impede the progress of traffic. Again, the aerial map shows data which might be tedious and expensive to acquire in the field, and, since all important details are apparent when studied in the office, the expense of several trial lines of relocation may be saved.

"Aerial surveys in transportation and traffic density studies have been found of considerable value and no doubt will find greater application within the near future. While this method has heretofore been resorted to mostly in cities having congested traffic areas, the latter condition is by no means confined to cities alone. Many of our county trunk highways are operating to capacity at certain periods of the day, and relief is a serious and, in most cases, an expensive problem. The aerial map discloses much interesting and valuable information relative to mass movement and open spaces in heavy traffic which could not be shown by any other method."

As the outstanding example of aerial surveying as applied to tax reappraisal to date, Mr. Abel mentioned work done in several Connecticut cities, which was described in THE AMERICAN CITY of April, 1927, by Charles M. Emerson in his article entitled "Aerial Surveying as Applied to Tax Equalization."

Aerial Views Disclose Lack of Adequate Planning

Pictures such as these show clearly the value of the airplane as an aid to city planning and traffic surveys. They also suggest (in the upper picture) the desirability and possibility of reserving sites for parks, playgrounds, schools, etc., before development becomes too intense; and (in the lower picture) failure to provide adequate downtown breathing spaces in our rapidly growing cities.

The upper view is from an aerial photograph of Little Neck, in Queens County, Long Island, New York.

The lower view shows the business center, railroad terminals and a part of the waterfront of Albany, N. Y.

Both photographs are reproduced through the courtesy of Fairchild Aerial Surveys, Inc., New York.

Data Needed for a Ten-Year Plan of Regional Highway Improvement

By J. GORDON McKAY
DIRECTOR, CLEVELAND HIGHWAY RESEARCH BUREAU

IN the regional traffic areas of the country, adjacent to centers of population, are found the great density of traffic and congestion on the principal arterial highways and city streets, as well as the most serious traffic distribution, control and safety problems requiring relief to insure efficient and safe transportation for passenger cars and motor trucks and to reduce the street hazard to human life. The complicated street and highway problems in these areas include:

Lack of centralizing control over planning and construction of routes passing through several jurisdictions

Financing methods

Convergence of main routes as they approach the center of distribution

Location and construction of new arterial highways

Acquisition of new right-of-way

Widening of present right-of-way

Widening of existing road and street surfaces

Construction of new bridges

Reconstruction and widening of existing narrow bridges

Double-deck roadways

Grade separations, both rail and highway

Bottle-necks

Lane marking

Traffic control

Signals

Provision of vehicle storage space

Parking

Preservation of right-of-way for future highway use

Treatment of main intersecting traffic routes

Blind intersections and crossings

Traffic obstacles

Four Essential Types of Highways

Highway planning and construction in a regional area consist, essentially, in the provision of proper facilities for the direct, expeditious and safe movement of large and small volumes of traffic and require:

1. Sufficient main arterial routes between the principal sources of traffic

2. Circulatory belt arterial routes connecting the main arterial system and providing facilities for distribution and inter-change of traffic between routes and for by-passing traffic

3. Lateral or feeder routes connecting the secondary sources of traffic with the main arterial and belt route system

4. Minor or local traffic routes

A properly balanced plan of improvement utilizes, in the main, the existing improved system of roads and streets and provides relief for existing, and the prevention of future, traffic congestion.

A Comprehensive Survey of Highway Traffic

The plan of highway improvement for the Cleveland Regional Area, developed by the United States Bureau of Public Roads in cooperation with the Board of Commissioners of Cuyahoga County, is based on the following classes of evidence:

1. Present highway traffic.

The daily volume of passenger car, truck, and bus traffic on each section of the present highway system was determined; a forecast of future traffic was made for each of these sections for five, ten and fifteen years, respectively; and each section was classified as a major, medium, or minor traffic route. This information determined the highway planning requirements necessary for their satisfactory improvement.

2. Distribution of highway traffic.

The points of origin and destination of traffic operating between the various sections of the Area were analyzed to determine the necessity for new routes or connections, and results of the study constitute the basic evidence in support of the plan of new routes and connections.

3. Present condition and estimated life period of existing surfaces and structures.

Each section of the highway system was inspected, analyzed and classified as satisfactory for ten years, salvable as subbase in place, salvable as material, or of no value for reconstruction.

Bridges were classified as satisfactory, requiring replacement, or in need of widening.

Railroad grade crossings were classified as requiring separation or the installation of modern methods of warning and protection to traffic.

4. Basis of proper surface width of new routes, present highways, and structures.

Traffic capacity analyses of road surfaces of various widths were made to determine the economic width of surface required for each section of highway. These studies, which were made on surfaces ranging from 18 to 40 feet in width, included observations of vehicular speed and transverse distribution on the roadway.

5. The present type, width of surface, and the width of right-of-way.

6. Studies of the density, distribution and trend of population and industrial growth in the cities and suburban areas.

7. Special studies of arterial, lateral, belt and by-pass routes, relocations of sections of highway, unimproved gaps in the present system, time studies of traffic and train movement at railroad grade crossings, separation of grade at the intersection of heavy traffic routes, and topographic and hydrographic surveys.

8. Conference with the several county boards and county surveyors and with the officials of the cities and villages of Cuyahoga County to receive their suggestions and plans for highway improvement.

9. Detailed studies of the cost of construction, using surfaces and structures of modern design, and average prices of construction in the region. This evidence was used as the basis for estimating the cost of the planned improvements.

The Resulting Ten-Year Plan

The resulting ten-year plan of improvement, involving the proposal of new arterial and belt routes and connections, of new construction on existing routes and reconstruction and widening of present surfaces, of bridge construction and railroad grade separations, it is estimated will cost, exclusive of property damages and right-of-way, $63,000,000. The cost of structures is approximately one-half of the total cost. The plan of construction has been approved by the United States Bureau of Public Roads; the Ohio State Department of Highways; the County Boards of Cuyahoga, Geauga, Lake, Lorain, Medina, Portage and Summit; and other cooperating agencies. The approved plan of highway improvement is now being developed by the several counties, cities and villages in the Cleveland Regional Area.

—From an address before the annual convention of the American Road Builders' Association, held in Cleveland, Ohio, January, 1929. The recently published "Report of a Plan of Highway Improvement in the Regional Area of Cleveland, Ohio," was listed on page 185 of last month's issue and may be obtained from the Bureau of Public Roads, Department of Agriculture, Washington, D. C.

A City and County Garden Commission that Promotes Civic Beauty, Safety and Thrift

By P. W. KOEPPEN

THE city of Milwaukee, Wis., and the county of Milwaukee, since 1917, through joint appropriations and a joint appointive garden commission, have been building up an interest in gardening for adults and children which has resulted not only in a more beautiful city and suburbs, but in definite savings in refuse collections which have more than paid the expense of carrying on the work.

An Important Work Carried on with Little Money

The appropriation given the Milwaukee City and County Garden Commission, is only $6,000 a year. Of this amount, $1,000 is paid by the county and the balance by the city.

Only one member, the Secretary, Mrs. William C. Kroening, is paid a salary. The other members represent the Schools, the Common Council and the County Board. The present members are: Milton C. Potter, Superintendent of Schools in Milwaukee; Mrs. H. F. Godeke, President of the Milwaukee County Parent-Teacher Association; A. Froemming, of the Street Trades Department of the Milwaukee Public Schools; Charles L. Davis, Superintendent of Street Construction; O. W. Spidel, City Forester; Alderman Max Galasinski and Alderman Stormy Thompson of the Common Council; and Supervisors James E. Roberts and Frederic Heath of the County Board. Commission members serve a four-year term, and are empowered to appoint other members who would be helpful.

The Garden Commission has found dozens of ways to encourage gardening. It has sold seeds at cost, to be planted in yards, in vacant lots assigned to families without yards, in window-boxes. Each year it stages a large vegetable and flower show in the Milwaukee Auditorium, with cash prizes for children and adults, and awards for schools. It provides shrubs and bulbs for city parks. Any project, in short, which would make the city or county more beautiful, is work for the Commission.

Cooperation from Street Departments and City Hall

The Garden Commission takes orders for plowing, which is done by the Street Sanitation Department of the Board of Public Works. This is free for those unable to pay for the work. The Street Sweeping Department agreed to provide leaves and street sweepings for garden fertilizer free of charge on request.

A booth is conducted in the basement of the Milwaukee City Hall where the finest quality of seeds and bulbs are sold. The booth is open for three months in the spring and one or two days (for bulb sales) in the fall. In addition to authoritative advice at the booth, the Commission supplies complete garden books, fully illustrated; books on garden pests, with colored illustrations; pamphlets on plowing; pamphlets on fruits, berries, etc.; and information on shrubs, flowers, etc., suited to Milwaukee's climate. Catalogs from all prominent nurseries in the United States are kept on file for general use.

Ten thousand tomato plants were furnished free by the Milwaukee County Agricultural School and distributed in one day through the Garden Commission's booth. Although the limit was one dozen to a person, the hundreds of people who came long before the office opened, soon exhausted the supply. In the spring of 1928, 10,000 tulip bulbs were sold in less than seven hours. A half-day was all that was necessary to sell 500 lillium candida. One year, roses were offered and 5,000 bushes were sold in a single day. The Commission also furnished 50,000 tulip bulbs for city park planting last spring.

Organizing the School Children

To build up interest among the school children, a definite campaign was worked out, which included a letter sent to school principals and a personal call following it up. Garden contests are now put on in almost every school, with blue, red and white ribbons as awards for the best flowers and vegetables.

All children are also eligible to compete in the annual Garden Exhibit. To make gardening easy for them, seed order sheets are provided and orders taken at the schools. Children unable to pay are given seeds free.

Taking advantage of the strong group feeling which children have, the Commission organized clubs among the school children. For the children living in the very congested sections of the city, a special window-box contest was provided in some schools. The boys of the Pre-Vocational School planted pine seedlings, and the students of the Boys' Technical High School planted curb trees.

THE ANNUAL EXHIBIT OF THE MILWAUKEE CITY AND COUNTY GARDEN COMMISSION

PLANTING GROUNDS OF URBAN LEAGUE IN COOPERATION WITH THE MILWAUKEE CITY AND COUNTY GARDEN COMMISSION

Every encouragement was given the colored people of the city to plant flowers and beautify a section of the city which ranks among the least lovely. The children were given rich soil, seeds and bulbs. Forty-five colored women were organized into a group and shown how to plant gardens and window-boxes. The Commission provided the seeds free.

The climax of this gardening program comes the third week in September, when the annual garden exhibit of the Milwaukee City and County Garden Commission is held in the Milwaukee auditorium. Admission is free. The contests in the schools are held in advance and the awards of ribbons made. Even though a child may not have won in a school contest, he is eligible to compete in the big meet. Contestants represent every part of the county, for the contest is open to all amateur gardeners. There is no entry fee. There were more than 1,000 competing last year, and $300 was awarded in prizes. This amount varies from year to year with the number of contests listed.

Prof. J. G. Moore, head of the Horticultural Department of the University of Wisconsin, acted as judge. He said the 1928 showing was the best ever presented in the state of Wisconsin.

Benefits Summarized

There are a thousand angles to this work of interesting residents of Milwaukee County in gardening. The work of the Garden Commission has been summarized by Mrs. Koening as:

"Encouraging back yard and vacant lot gardening; awakening the interest of adult and junior citizens in maintaining gardens to provide healthful recreation and economic returns; increasing the value of property; promoting cooperation between individuals; eliminating the vacant lot as a breeding-place for weeds; and decreasing the expense of the Public Works Department through use of ashes, leaves, etc., to enrich the soil.

"Back yard gardening brings parent and child closer to one another, it contributes to the safety of the child—keeps him off the street—and cuts down the municipal investment in parks and public playgrounds. Gardening discourages congestion and makes for a more beautiful city."

A City Must Pay Either for Planning or for Lack of Planning

IN its new volume on Population, Land Values and Government, the Regional Plan of New York and Its Environs points out that the choice of the citizens of a city or region is not between spending money and saving it, but between spending money extravagantly and without forethought, and expending it wisely in accordance with a well-thought-out plan.

"The features of a city or regional plan that involve the expenditure of public funds on unremunerative enterprises are more limited than is usually supposed. Some parts, i. e., those relating to railroads, transit lines, and other public utilities, should be made to pay for themselves. Other parts, i. e., those relating to zoning, controlling the platting of land, or similar measures that deal with restriction of abuses of property and with the protection of health, safety and general welfare of the community—if reasonable in the eyes of the courts—may be carried out without financial outlay other than that for the small extra cost of administration.

"It would be possible to limit a plan to remunerative improvements, plus provisions which regulate traffic, platting, and heights, densities and uses of buildings in accordance with the police power, so that it would contain nothing that involved public expense on construction. A plan so limited would be of immense value in promoting public well-being, and although costing little, would probably add indirectly to public revenues.

"The financially unremunerative projects, which are often regarded as the be-all and end-all of a city plan, are practically limited to three classes of improvement:

1. Proposals for constructing new highways or streets, diverting or widening existing highways or streets, and incidental purchase of private property and reconstruction of buildings.
2. Purchase of land for parks, parkways, playgrounds, etc.
3. Erection of public buildings and related improvements.

"A plan may or may not contain proposals with respect to such matters. Because the plan treats these and other features comprehensively, and forecasts the needs of the community for thirty or forty years ahead, it will appear, on the surface, to contain suggestions that involve great additions to the normal expenditures of the community. But this is not so. The existence of a plan, however elaborate or far-seeing in its proposals, does not impose any obligation on the community to spend more money than it has to spend in any case to meet its normal requirements. On the contrary, it may be that the plan will indicate directions in which expenditures that would seem to be necessary in the absence of a plan, would really be wasteful; and also, the plan may give the community guidance as to the order of importance, character, and treatment of improvements. Economy will be the result.

"'The money which will carry out the Plan of New York', said Charles D. Norton, 'is the money which New York will spend in any event, whether it has a plan or not. With a city plan, expenditures can proceed along permanent lines; without it, public expenditures are diverted into projects which are not enduring, and are therefore wasteful.'"

Manila's New Water-Supply

Angat Project and Novaliches Earth Dam Part of $8,500,000 System Under Construction in the Philippine Islands

By H. F. WILKINS

THE city of Manila in the Philippine Islands is soon to have a water-supply as good as the best in America or Europe, a system that reaches into the mountain gorges to the north and east with an $8,500,000 construction project. Four million dollars' worth of work has been let to contractors and is now under way, including the largest earth dam in the Orient, a 4-mile tunnel through andesite rock, 19½ miles of graded macadam roadway, and about the same length of cut and cover conduit interspersed with smaller tunnels through adobe rock ridges. A new and complete filter system of the most modern type is also included.

It is estimated that with but slight additions from time to time at a minimum of cost, the present system will last the city for more than 100 years at its present rate of growth. All the tunnel work is designed to carry 80,000,000 gallons a day, and such conduits as will carry less than that at present can easily be paralleled with other pipes.

Manila's present water-supply is inadequate, and the new system is coming along just in time to save the city from serious shortage. Engineering work on the new project is no less interesting because of its tropical setting—quite the contrary. The whole job is typical of far-sighted plans conceived and supervised by American and Filipino engineers and worked out with native labor and native foremen.

Manila is a fairly big city. Its population is accepted at 325,000. This does not mean that the city uses as much water as would a city of similar size in the United States. So many of its people, in the old Walled City, for instance, live just as they did when the Spaniards occupied the place, that there are only 21,400 services using water from the municipal system.

Needs for the new system were based on the estimated consumption of 19,000,000 gallons a day in 1919, and an additional million gallons a day each year. The need for more water has not increased so fast as that, so, by close figuring, water-works engineers were able to lower the present outlay of funds necessary to provide an adequate system by cutting down the size of cut and cover conduits and siphons that could be built in duplicate lines as the need arises in future years.

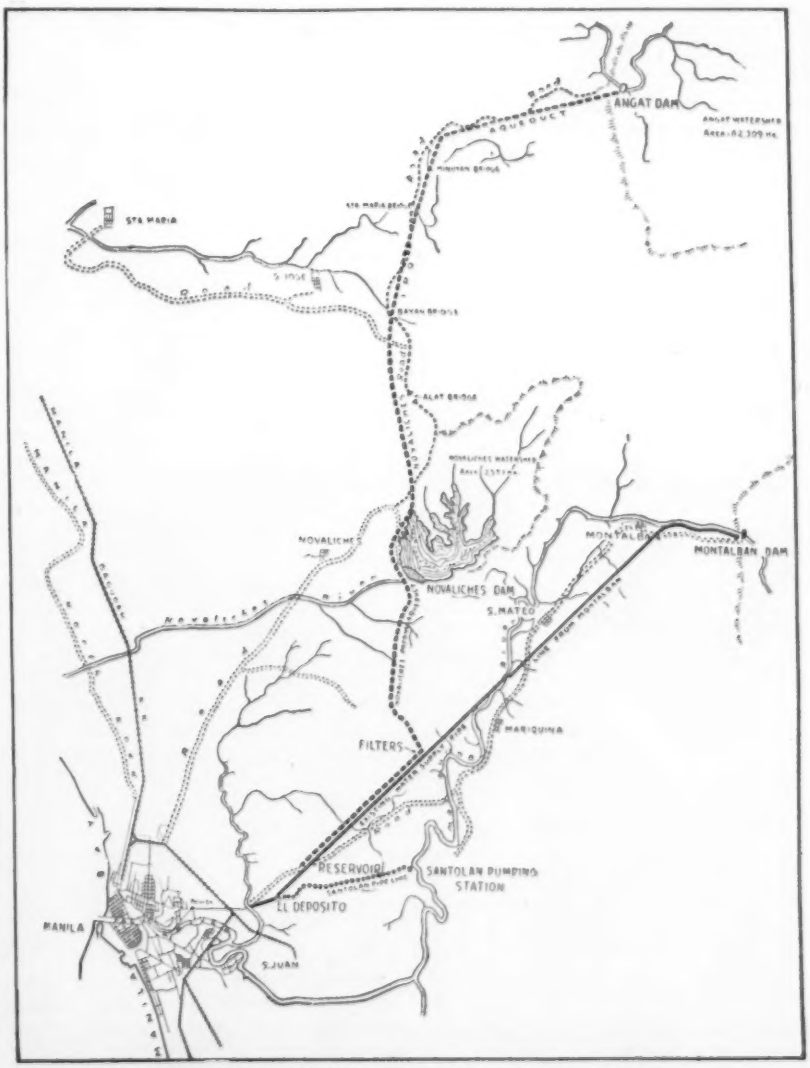
Historical Background

The historical background of Manila's water-works system is quite as interesting as that of any city in the world. It involves a strange old will left by a Spaniard in 1743, three keys to a safe deposit box, royal orders and decrees of the Spanish Government, a tax on beef to provide a new water system years ago, and political intrigue of one kind or another that delights those who like to dig in old records.

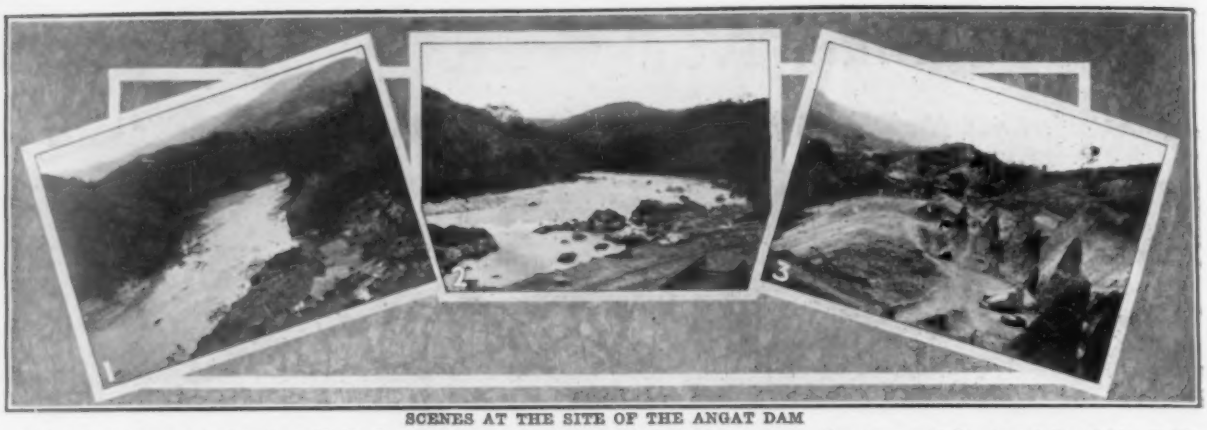
All this has a bearing on the construction of the proposed system and the portion under construction, for it led to a problem in planning the multiple layout that was solved neatly and efficiently enough to be an example and a possible precedent in other cities in other lands.

It seems that one General Don Francisco Carriedo, a Spanish gentleman of Manila, presumably a merchant, made a will in 1743 by which he left in trust the sum of 10,000 pesos for the construction of a water system. His instructions were that this fund was to be kept in a box with three keys—one in the hands of the mayor, one with the senior deputy of the chamber of commerce, and a third with the senior alderman of the city.

No matter how great the emergency,



MAP SHOWING THE SOURCES OF THE MANILA WATER-SUPPLY



SCENES AT THE SITE OF THE ANGAT DAM

1. The Angat River at its junction with the Ipo, the site of the Angat Dam. Part of the construction camp may be seen at the right. 2. The western end of the dam will be at the shore where the two bamboo poles are seen in the right foreground. 3. Road building just above the construction camp. Note the pillars of earth indicating the depth of excavation by hand

the will specified, this money was to be used for no other purpose than to build a water system. Carriedo wanted three or four public hydrants in the Walled City and a few convenient ones outside, and he stipulated that water was to be piped into two or three of the leading convents and monasteries. Anyone else who wanted water from the Carriedo system had to pay part of the cost of construction.

If this sum had been properly invested at the time, it would amount today to some billions of pesos, for the accepted interest rate in the Philippines has been up around 10 per cent ever since Spanish days. But the fund, apparently through no fault of the trustees, went through enough vicissitudes to deplete it considerably by the time they were ready to use it.

Two alternate projects were prepared in 1865 by the Spanish engineer selected to carry on the work. The first provided for a Roman system or gravity supply, and was estimated to cost 12,250,000 pesetas, or about the same amount in pesos at the present valuation. A peso is worth 50 cents in United States currency. This was far beyond the means of the Carriedo fund.

The substitute proposal called for a pumping-station system and was estimated to cost 745,509 pesos, still far beyond the means available.

By a royal order, the city of Manila was supposed to contribute 100,000 pesos from city funds, but the various districts refused to contribute. They said they didn't want to diminish the glory of Don Carriedo by interfering with the fund he left. The next proposal was that a tax should be levied on meat consumed in the city to pay off the debt incurred by the proposed system. Few cities of the world have anything so strange as a tax on beef to provide water, yet this is the plan that finally was carried out in Manila. It continued in force until Dewey came in 1898.

The First Water-Works

In 1878 the first Manila water-works system finally was started. It was to consist of a pumping-station at Santolan, on the Mariquina River, about three miles east of the city limits. It was completed and put into use in 1882, all built from the Carriedo fund and meat tax receipts.

These pumps, though they had to be supplemented later, are still in use today in the dry season, to add to the supply from Montalban. But the water at Santolan became polluted, and in 1902 it was decided that something had to be done. The Insular Government authorized a bond issue, and the Montalban dam was built on the same Mariquina River, a few miles east. That gave the city two separate systems.

This Montalban gorge, on which the dam is situated, is world-famous for a peculiar reason. The scenery is very picturesque and the gorge is a favorite spot for sightseers. Its chief fame lies in the fact that every evening at sundown, millions of bats fly out of a deep cave in this cliff and darken the sky like a stormcloud. But this has nothing to do with the water-supply.

The Montalban supply was hardly designed to last forever. When the increase in demand for water first gave evidence of becoming acute, the situation was unfortunate. The city was financially unable to build. It had reached its limit of bonded indebtedness. The trials and tribulations of the period are interesting enough for later detail, but the point is that nothing was done to increase the supply until agitation was started for the present construction some years later.

Studies for Present System

The problem at this time was to build for the present as well as for the future. Complete surveys of the surrounding watershed areas were made, and it was apparent that the Angat River, some 35 miles to the northeast of the city, was the best available supply in terms of the future. But to bring the water down from here required the construction of a 4-mile tunnel and a concrete dam, to say nothing of the long conduit. The tunnel and dam at Angat will scarcely be completed for five more years. Meantime, the city of Manila needs water.

The Novaliches Dam and Reservoir

So the big earth dam at Novaliches is being built. It will be ready to supply Manila with enough water for her needs until the Angat project is finished. It is believed to be the biggest earth dam anywhere in the Orient and one of the biggest in the world. It furnishes an intermediate water-supply, located just a little less than half-way between Manila and the Angat dam, and when the latter is finished, its supply will be joined to that of the Novaliches dam reservoir.

The Novaliches reservoir will contain a total of 9,000,000 gallons of water, 7,000,000 of which is above the draft line. The dam itself is to contain about 650,000 cubic yards of various materials, mostly clay and adobe rock. It will cost when completed a total of 1,500,000 pesos. The reservoir is about 140 times as large as the newly built reservoir at San Juan (part of the Montalban system) and 400 times as large as the old *deposito* of the Carriedo system. The water surface area will be 1,500 acres, and the depth near the dam nearly 100 feet.

According to a description written for the Manila *Daily Bulletin* by A. Gideon, Manager of the Metropolitan Water District, the dam is of the earth embankment type with 3 to 1 slopes, with one berm on the upstream side and two on the downstream side. The core is of clay and the upstream and downstream sides of adobe rock. Under the upstream side is a cut-off wall of concrete going into the adobe foundation, and the dam will be paved with concrete on the up-

stream face and sodded with grass on the downstream slope. When finished, the dam will be 20 feet wide across the top and 575 feet wide at the widest portion on the bottom. The length along the crest is 1,060 feet.

The earth embankment type was chosen because there was no other alternative. There is no proper foundation for a big concrete dam at this point. Materials for building such a dam are not at hand. There is no proper gravel for aggregate within reasonable hauling distance, and the topography of the country is such that other means of bringing it in are out of the question. The time element is a consideration too. The earth dam is quicker to build and just as practical.

Methods of Construction

The embankment materials are taken from 14 different pits within a maximum radius of 3,000 feet. The haul is made and the material distributed mostly with trucks. One-ton Fords were used at first, 40 of them, but as these have worn out with time and hard usage, they have been replaced gradually with different makes of larger capacity, mostly White trucks. There are 50 big trucks on the job today, in addition to caribao carts which account for 1,000 loads daily. Five steam shovels are located in the various pits, all of them Marion outfits with buckets ranging from ¾-yard to 1¼-yard capacity. Half-a-dozen steam rollers ply the growing embankment 24 hours on a stretch. Two of these are Buffalo-Pitts 15-ton embankment rollers, and two others of the same make are 13½ tons and 10 tons each in weight. There is one Austin 15-ton gas tractor and one Case tractor of 13 tons on the job, doing the same work as the steam rollers.

The working surface is lighted at night by high-power globes strung between a series of electric light poles. The poles can be easily moved about, and the improvised system has proved entirely satisfactory.

The outlet from the reservoir is through a tower of reinforced concrete on the upstream side and a tunnel near the west end of the dam.

The Filtration Plant

The filter system is to be one of the most complete and up-to-date of any in the Orient. The filter beds will be located at the junction of the new Angat aqueduct with the old Montalban aqueduct. The plan is to be of the rapid sand, mechanical type. The filters will operate at the rate of 125,000 gallons per acre per day. When finished, they will have a normal capacity of 40,000,000 gallons a day, and the sand area will be about a third of an acre, so arranged that when the capacity of the filter is reached, a duplicate set can be built alongside without disturbing the existing plant. On completion of the duplicate set, the plant will have the full capacity of 80,000,000 gallons a day, equal to the flow of the permanent tunnel conduits.

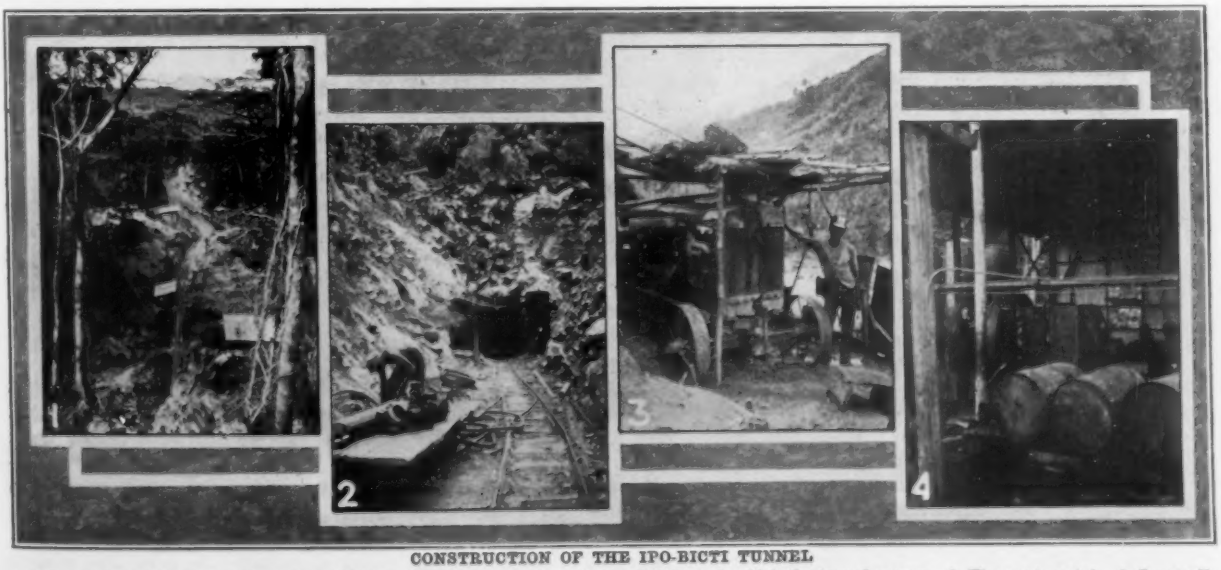
The filters will be equipped with all modern automatic appliances. The rate of flow will be automatically controlled, water-measuring apparatus will be included, gates will be operated by machinery, and further equipment will include wash-water tanks, aeration nozzles, and a liquid chlorine plant, pipes and valves to wash the filter sand and coagulation tanks. No person need fear to drink water direct from house taps or even street hydrants. This will be unprecedented in Oriental cities.

It has been estimated that the residents of Manila spend about 1,000,000 pesos a year on artesian well water, distilled and aerated waters and beverages exclusive of liquor, used to avoid drinking unsafe water. On completion of the filters a great deal of this expense will be eliminated, as faucet water will be even safer than bottled water. Bacteriologists will be on the job all the time to see that the filter is properly operated and does not get clogged or dirty in any part. The filtration plant and accessories will cost about 1,500,000 pesos.

The Angat Project

The Angat project will be the main portion of the completed system. The location was carefully considered before the Angat River finally was chosen. The annual rainfall of the Philippine Islands is very abundant. It is about 2½ times as great as in the eastern United States and 7 times as much as on the California coast. But it is crowded into a few months of the year, and in the remaining months there is very little rainfall. Geologically, the Islands are of very recent formation. There are but few lakes, ponds and swamps. The run-off after rainfall is so rapid that there is a meager amount of natural stored water.

The Angat River is in Bulacan province. Its head waters touch the head waters of the Mariquina River, on which the Montalban dam is located. The distance from Manila to the proposed diversion dam on the Angat is just under 22 miles in a straight line, and a little over 32 miles as the conduit runs. The watershed above the proposed dam at Ipo on the Angat has an area of



CONSTRUCTION OF THE IPO-BICTI TUNNEL

1. The west portal construction camp, looking down from the top of the cliff through which the tunnel passes. 2. The west portal. 3. Ingersoll-Rand portable compressor at the east portal. 4. Ingersoll-Rand stationary compressor run by a Blackstone engine of British manufacture at the west portal

some 275 square miles and is practically uninhabited. The whole area has been proclaimed government territory and a reservation, by order of the Governor-General, and what few squatters there are on the property are moving out now, loading families and belongings on picturesque *bancas* or large bamboo rafts and floating them down the gorges and rapids of the Angat to greener fields.

The Angat River water was analyzed both chemically and bacteriologically during various stages of the river and was reported by the Bureau of Science as of excellent quality. Data on the amount of water discharged by the Angat were gathered, compiled and checked, over a period of years, and from this information there is no doubt that the Angat River is sufficiently pure and abundant for the city's needs for many years to come.

The Angat dam, on which construction is not yet started, will be located at the junction of the Angat and Ipo Rivers, the latter being a small tributary of the Angat. As planned at present, the dam will be of the spillway or gravity type, concrete construction, with very large blocks of rock embedded in the concrete to lessen the cost.

The riverside gorge at this place is composed largely of andesite rock of substantial nature and is believed to be the best location on the whole river. A series of rapids at the chosen site indicates that the rock is sound and could not be further eroded by flowing water. The site was examined by a number of independent geologists and they pronounced it satisfactory.

The most important part of the Angat project now under construction is the so-called Ipo-Bicti tunnel, which is just a little more than four miles long, leading from the proposed Angat dam through a high rock ridge to the valley of the Santa Maria River.

This tunnel is being drilled by Filipino labor under foreign supervision, from both ends, using Ingersoll-Rand rock drills and Ingersoll-Rand compressors. The tunnel is a straight drift, 6.43 feet tall and the same distance across, with an arched roof. Almost all of it is through hard andesite rock. In this material the walls are straight. In softer spots at the two ends, they are slightly convex to give added support.

Excavated material is hauled out on a small hand-operated rail line with Koppel cars at present, but as it gets farther in, electric locomotives will be used. These have not yet been purchased. Drilling is to a depth of 6 feet, and blasting takes place once in 12 hours.

The date set for completion of the tunnel is five years from the time the contract was signed with the Atlantic Gulf and Pacific Co., which was in the latter part of 1926. The time is longer than it would be on a similar project in the United States because less machinery is used. The whole tunnel will be lined with concrete when completed. The maximum height of the rock ridge through which they are drilling is about 900 feet above sea-level.

Another important part of the project, also under contract to the Atlantic Gulf and Pacific Co., is the construction of 19½ miles of macadamized roadway, principally for the purpose of hauling machinery and equipment to the dam site, but also designed for motor traffic when the job is completed. The Angat dam site is a beauty-spot hitherto inaccessible to tourists and visitors, and it is expected that the opening of the road to general traffic will result in a scramble for vacation home sites in the mountain gorge district.

Filipino Road Building

The road is well graded and macadamized to a depth of 8 inches, and uniformly 13 feet wide. It is almost entirely a hand-built road. Caribao or water buffalo furnish the motive power for grading and hauling, and some of the tools are even more primitive than pick and shovel.

The Filipino manner of road building is effective but comparatively slow. Contracts are sublet to native workmen who undertake to do a certain section at a set cost and get it finished whenever they please. This manner has been found to be superior to any other because thus they usually work day and night in order to get their money quicker.

Another peculiar feature of Filipino road building is the practice of leaving a series of dirt pillars in the middle of the road wherever a grade has had to be cut through. A tuft of grass is left on top of these, and when it comes time to count the cost, nobody can deny the amount of material laboriously excavated with pick, shovel and wheelbarrow. These pillars are removed when the cost is computed and the money promised.

For road drains 3,000 feet of Armco corrugated pipe is being installed. Several large bridges and numerous culverts of various sizes were built to carry the highway over streams traversing the country. The Santa Maria River is spanned by two steel trusses, as it is the largest stream on the line and often subject to floods in the rainy season. These trusses are above the flood line and will afford uninterrupted traffic. Smaller streams are crossed on concrete bridges and culverts.

The Santa Maria valley will be crossed by a siphon and a cut and cover conduit of reinforced concrete, which will discharge into another tunnel a little less than 3½ miles long. From this last tunnel, water may discharge directly into the Novaliches reservoir or be conducted around the reservoir direct to Manila, thus by-passing the reservoir when necessary.

From the Novaliches reservoir the water will be conducted to the filtration plant by means of a series of tunnels, siphons and a cut and cover conduit of concrete construction. The size of this conduit, which is of permanent construction, is equivalent to a pipe of 7 feet diameter, and it has the full capacity of 80,000,000 gallons a day, four times the capacity of the present conduit from Montalban.

There are some 2,000 workmen employed on the whole project at present, and there will be more when dam construction starts on the Angat River. More than 100 trucks are in use, including the 50 working on the Novaliches earth dam.

Health of Laborers

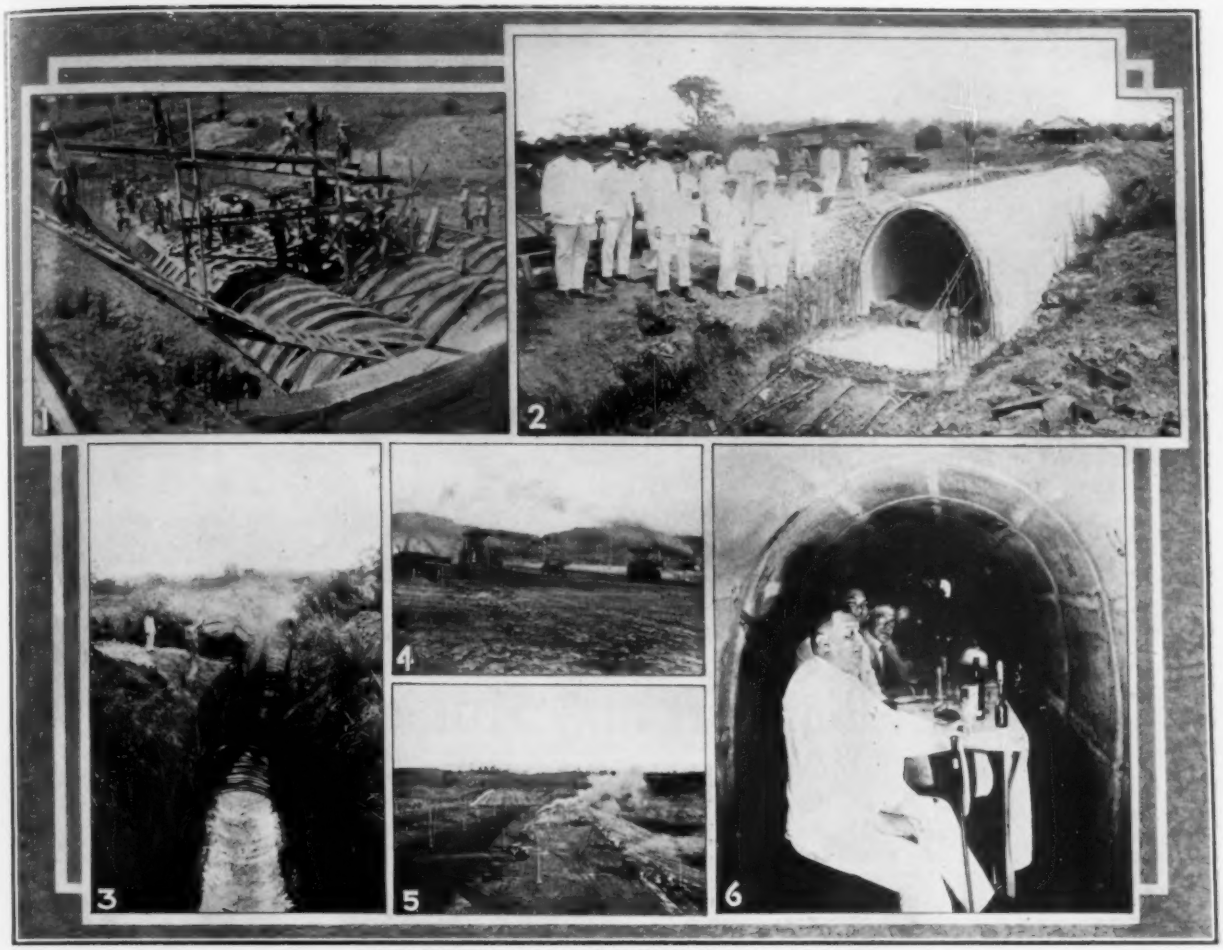
On any project of like nature in the Philippine Islands, malaria is more or less existent, although this one is as clean as any ever started. With the help of experts from the Rockefeller Foundation, all running water is treated once a week with paris green to kill the larvae. Malaria-bearing mosquitos breed only in running water in the Philippines, contrary to general conditions elsewhere.

To care for employees when sick, four temporary hospitals were set up in strategic positions, and doctors, male nurses and sanitary experts are in constant attendance upon the work. The hospitals, though temporary, are well built, protected by mosquito netting, and provided with such medicines as may be needed to combat malaria and other local diseases.

The personnel of the work includes all kinds of people, from common Filipino laborers to American engineers, biologists, chemists, research men and lawyers. Paul W. Mack is the engineer in charge of the entire project for the Metropolitan Water District. He is a man of wide experience on similar projects in the United States. Thomas Crabtree and Patrick O'Rourke are resident engineers on tunnel construction and road work for the Atlantic Gulf and Pacific Co., of New York.

Water-Waste Campaign

At the time when the new project was first considered, the city of Manila could not afford to spend money on it and it was necessary for a time to devise some means to keep the city in water until a new source could be tapped. There resulted a unique campaign of economy to make the meager supply available stretch over the extended dry season.



CONSTRUCTION OF NOVALICHES DAM AND AQUEDUCT

1. Reinforced concrete tunnel under dam, with corrugations to prevent the movement of water along the outside of the pipe. 2. A cut and cover aqueduct section measuring 5.54 by 5.9 feet. 3. A reinforced concrete siphon 5.54 feet in diameter. 4. Rolling the earth dam with two Buffalo-Pitts 15-ton steam rollers. 5. A general view of the Novaliches Dam. 6. A banquet served in the tunnel by J. B. Finley, Manila contractor. The Mayor of Manila is seen in the foreground, and A. Gideon, Manager of the Metropolitan Water District, is third at the table

House-to-house inspections were made to detect leakage. Close scrutiny was kept on meter readings so that excessive consumption could be readily detected. Propaganda was sent out to water users to make them keep plumbing in repair so that economy could be kept down to a fine point. It was pointed out that such conservancy measures would serve both to keep down individual bills and to save water so that the rest of the city could use it too. A 24-hour service for broken pipes was maintained and people were urged to use it.

Along with this campaign was built up an efficient office system and a new system for collecting bills. Non-payment after a second notice results in the client's having his water shut off, and a fine of $1 was imposed on those who failed to pay. The increase in receipts was surprising.

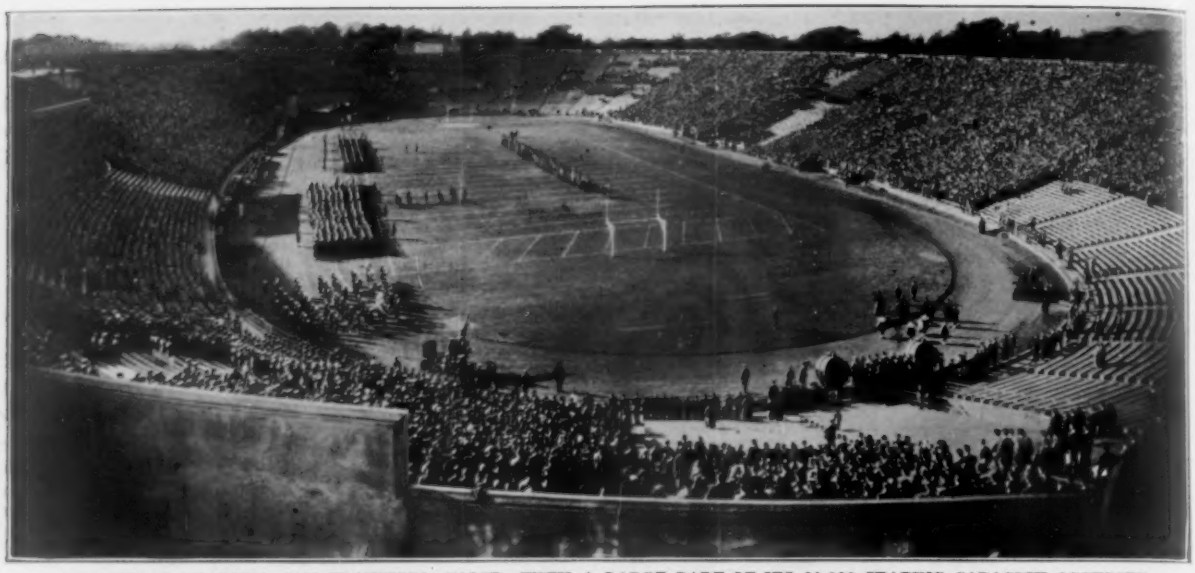
With this internal economy worked out and with a set of flash boards placed on top of the Montalban dam to deepen the reservoir, the city has made adequate for its needs a supply of water that has been inadequate before.

Metropolitan District Created

Meantime, politicians and water-works officials were doing their level best to somehow raise money for the new construction. They worked out a plan and presented it to the Legislature, recommending that a department separate from all city offices be set up and called the Metropolitan Water District. This organization could borrow the additional amount of money needed and be absolutely self-maintaining; also have perfect freedom of action to do whatever was needed to build up the water-supply. City officials approved the recommendation. The matter was submitted to the Governor-General as the only practical solution. He forwarded the matter to the Philippine Legislature, recommending enactment of the necessary legislation and authorization of 12,000,000 pesos' worth of bonds, upon which both principal and interest were to be guaranteed by the Insular Government. This was passed.

Later, on recommendation of officials of the Metropolitan Water District and in order to lessen the interest rates on the bonds, an amendment was enacted whereby the Insular Government was to sell its own bonds and with the proceeds thereof buy the bonds of the Metropolitan Water District on the same terms and conditions that were dictated for the sale of the previously authorized bonds.

So is the water-supply, present and future, of the city of Manila regulated. The Metropolitan Water District, authorized and organized back in 1919, is a separate corporation and it has the city's water-supply in its own hands. Previous to the time when the city lost control of the water-works, it was a losing proposition. Since that time it has become profitable. The city government has been trying to get it back again, but recent settlement of litigation, and the appointment of A. D. Williams, Director of Public Works, as the district's consulting engineer, has assured that the Metropolitan Water District will continue to run things in its present satisfactory manner.



THE KEZAR STADIUM, SAN FRANCISCO, CALIF., WITH A LARGE PART OF ITS 60,000 SEATING CAPACITY OCCUPIED

San Francisco's New $450,000 Stadium Financed by Memorial Gift and Municipal Funds

By JOSEPH R. HICKEY
DIRECTOR, PUBLIC RECREATION, SAN FRANCISCO

"TEN years ago you couldn't have convinced me I would live long enough to see a high school football game that would draw 50,000 spectators. Indeed, that far back, an attendance of 5,000 at the most attractive high school football game in the country was something to remark about." Thus a San Francisco sporting editor comments on the spectacle of the annual Lowell Polytechnic High School football game at the recently completed Kezar Stadium on Thanksgiving morning. All of which is happy justification of the plan which brought about the enlargement of this sports arena and gave to San Francisco a stadium sufficient to handle any football game likely to be staged here.

Football and stadiums are inseparable. They are the twins of American athletic life; a combination refusing to be minimized in the various social intricacies of community affairs.

As the result of institutional rivalry, public interest in football throughout the United States has grown so rapidly that the smallest centers of population, as well as the largest cities, have been hard-pressed to provide facilities necessary to staging the great fall spectacle.

Athletic and Emotional Outlets

The glamor of these gladiatorial centers will not be dimmed by the routine demands of business or private life. They tend, on the contrary, to offer an emotional outlet and otherwise stimulate the most non-partisan observer.

The task of selecting a stadium program for any city is accompanied by many hazards, as each community has its own peculiar problems. So many divergent interests must be brought together in any undertaking of this nature, that it becomes extremely easy for those in authority to be led astray.

The proximity to San Francisco of two universities, both of which are equipped with large stadiums, had a tendency to delay any similar project in San Francisco until the Kezar stadium idea had its inception in 1924. The solution as to site, as well as the financial solution of this hitherto difficult problem, was provided by William F. Humphrey, member of the Board of Park Commissioners. The building was planned to occupy partly land in Golden Gate Park and partly adjoining land acquired by purchase.

A gift of $100,000 to Golden Gate Park by Mary A. Kezar in memory of her mother, Nancy H. Kezar, and her uncles, Bartlett Doe, John S. Doe and Charles F. Doe, made possible the first unit of the stadium. To this gift was added an appropriation of $100,000 by the Board of Supervisors.

At that time plans were prepared showing a vast amphitheater on this location with seats for 80,000 spectators. The architects, L. W. Hurd and Charles F. Masten, worked in collaboration with the late Willis Polk and Thomas F. Chace, consulting engineer. How close this visualization has been realized is evident in the latest step of the stadium construction, which has brought the accommodations up to 60,000, giving San Francisco a place for athletic contests in keeping with similar improvements elsewhere.

This recent addition was made possible by an appropriation of $250,000 by the present Board of Supervisors upon the recommendation of the Finance Committee, composed of Frank Havenner, Milo Kent and Charles Powers.

Architectural Design

When the enduring qualities of the construction are considered, the total cost of the stadium—approximately $450,000, or $7.50 per seat—is seen to be a reasonable price in comparison with other modern stadia. In type it is an articulated reinforced concrete structure, with a wooden deck covered with asbestos felt, on top of which is laid a coat of heavily sanded asphaltum.

Excellent provisions have been made for the press in the new plan. Under this heading come radio broadcasting rooms, telephone and telegraph equipment, and the most up-to-date scoreboard arrangement.

The architectural treatment is pleasing and in keeping with the surroundings. Its design represents a frank union of the formal dignity demanded in such

a civic monument with a bold, simple treatment of huge walls and openings. The irregular grouping of trees and shrubs along the South Drive and to the west has been effectively incorporated into the general scheme, as has also the open street frontage on Lincoln Way.

Meeting the informality of the site has led to the piercing of the Lincoln Way wall on the radial aisle lines with squared openings, embellished with quoins and decorated lintel, while the same radial piercing on the park side, where the wall is higher, has been handled with great arches framed in the graceful foliage of the fine old trees of the rhododendron dell. These two systems are brought together at the monumental entrance, developed into a dominating pavilion on the major axis, west fronting on First Avenue.

The great encircling wall has been decorated with cornice and base course, abrupt in scale, but handled with simple mouldings expressive of the materials used. On the south, or Lincoln Way side, an entrance motif featuring the minor axis opposite the Polytechnic High School, serves also to allow transition from the high encircling seat-bank wall to the low enclosing wall along the street.

It is the policy of the Board of Park Commissioners to make the stadium self-sustaining, reserving it at all times as a place where the public may witness the best attractions. For this reason a rental is charged whenever the public pays an admission fee to observe contests in the stadium.

This, in brief, is the story that underlies the whole undertaking, which is another record of achievement in San Francisco's progress.

What Does a Municipal Art Commission Do?

THIS is an interesting question because there has recently come to towns and cities all over the country a lively sense of the necessity of applying sounder architectural standards to public building undertakings. Not only must public officials look to the individual excellence and appropriateness of design of the newly undertaken constructions; they must consider also the harmonizing of new buildings with their surroundings and with the already existing permanent public buildings. Such problems may be, and in some cities are being, most effectively solved by a legally created art commission such as that of Los Angeles, Calif., which is required under the city charter to pass upon all municipal buildings and upon all structures on public property.

The official report of the Municipal Art Commission of Los Angeles for 1928 shows that a total of 527 plans representing an estimated valuation of $10,619,453 were considered, of which 474, representing a valuation of $8,709,213, were approved on first submission, and 11, representing a valuation of $252,675, were approved on re-submission. These plans included fire-stations, a humane department building, a police station and a hospital, 2 power distribution stations, 2 branch libraries, and a large number of recreation buildings including a bathhouse and a swimming pool, a boat-house, 5 field houses, and 10 park buildings.

The Commission, of course, passed upon plans for the $7,500,000 City Hall, completed a little over a year ago, and has since given approval, step by step, to the developing of interior decoration schemes. But it must not be considered that this Commission, nor similar commissions in other cities, have a full-time job of approving plans as substantial and dignified as those for a city hall, or even for a park building. Some of the 527 projects listed are for minor undertakings—a clock to be attached to a building, an ornamental traffic warning signal, a "structure on a roof," purpose undesignated, a storm drain outlet structure, and wooden guard-rails. Twenty-seven marquees for hotels, stores, and theaters figure in the report, as do a drinking fountain, railings for one of the city's new pedestrian subways, and bridge retaining walls. That some of the smallest items may bulk largest is shown by the fact that of the 527 plans considered, 308 represent designs for ornamental street-lighting projects to be realized at a total cost of $5,051,764.

The artistic status of a park lamp-post or of the banister-rail of a street stairway may not loom up with much importance on the debit or credit side of a city's affairs. The whole accomplishment of an art commission for any one year may not at first glance appear indispensable. But someone has said that the state of civilization we are trying to attain artistically will have been realized when every utilitarian object of our daily lives is made as beautiful as it is useful. And the real work of the art commission, after all, is the hastening of that day.

THE CITY HALL, LOS ANGELES, CALIF., BY DAY AND BY NIGHT

At the top of the structure, which was described in The American City for November, 1927, while under construction, is the powerful Lindbergh Beacon, for assistance to aviators

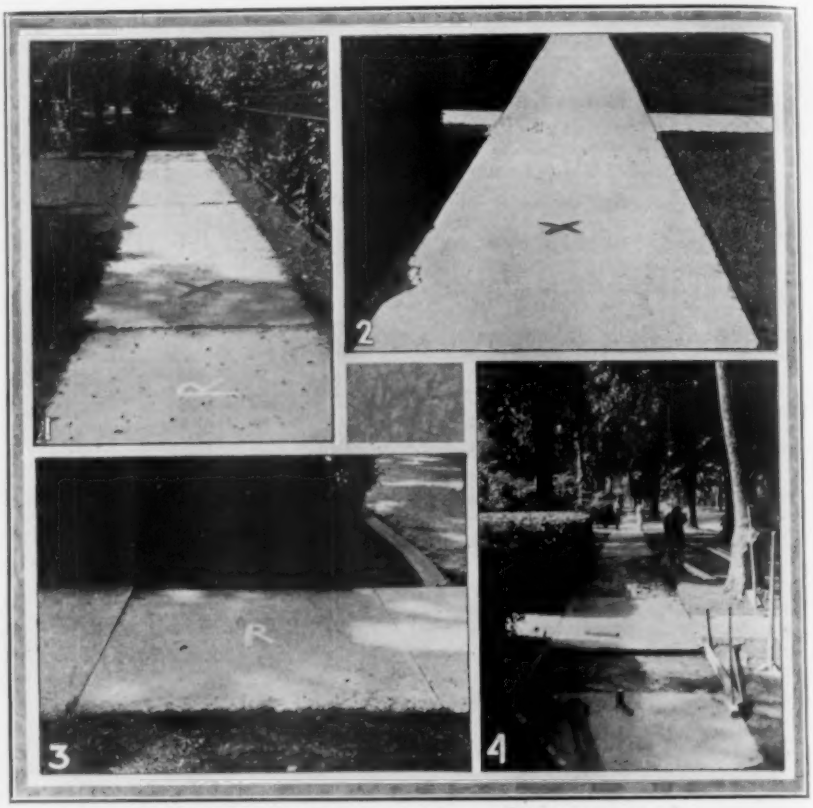
Wide World Photo

Methods of Making Sidewalk Repairs in Kenilworth, Ill.

THE village of Kenilworth, Ill., a residential town north of Chicago, has begun a systematic inspection and repair of all sidewalks. Many other towns and villages could noticeably improve their general appearance as well as the safety of their sidewalks by systematic repair.

Sidewalk slabs in many instances have been displaced by the growth of tree roots or by ordinary settlement. In the course of time drainage becomes poor and pools of water remain on the walks after heavy rains. In several cases slabs at driveway entrances have been broken by loads which the sidewalks were not intended to carry. Unless repaired, broken slabs and uneven slabs rapidly become worse and present an unsightly appearance. Broken areas are not only inconvenient but also actually dangerous to pedestrians. Under certain circumstances the property owner and the municipality may be held jointly liable for accidents caused by defective sidewalks.

The village of Kenilworth made a careful inspection of all sidewalks and marked the slabs to be removed with a red X painted on the walk; those to be raised were marked with an R in white paint. The corner or side to be raised was also designated with a white paint mark. The property owners were then notified of necessary repairs to the walks in front of their property. They were asked to have the work done and the village gave them the names of a few local contractors. All work outstanding after a certain date is contracted for by the village and financed by special assessment. It is expected that this course will not be necessary, as the cost to the property owners concerned would be considerably more than for private contract work.



MARKING SIDEWALKS FOR REPAIR IN KENILWORTH, ILL.

1. The slabs to be repaired were marked X for replacement and R for raising. 2. Slabs with corner breaks or cracks and those that were broken were designated by a red X. 3. Slabs that had sunk or lifted were marked toward the side most out of line. 4. Reputable contractors equipped with competent workmen and tools were recommended

Types of Plows Used for Cleaning Sidewalks in Westmount, Quebec

AT THE LEFT IS A WALSH V-TYPE BLADE SNOW-PLOW WITH 2-TON CATERPILLAR TRACTOR; AT THE RIGHT IS A TRACTOR-PULLED SNOW-DRAG FOR LIGHT SNOWS

Giving Shade Trees Wholesome Food

By CARL G. DEUBER, PH.D.

PLANT PHYSIOLOGIST, OSBORN BOTANICAL LABORATORY, YALE UNIVERSITY, AND BARTLETT TREE RESEARCH LABORATORIES

IN the sixteenth century, van Helmont of Brussels, in an attempt to understand the phenomena of soil fertility, performed an experiment with a willow tree in somewhat the following manner. He planted a shoot of willow weighing 5 pounds in 200 pounds of oven-dried soil. The soil was moistened with rain water or distilled water from time to time, and was in a vessel with a perforated metal top to exclude dust and débris. After five years, the shoot had grown into a tree weighing 169 pounds. At the conclusion of the experiment, van Helmont stated:

"In the end I dried the soil once more and got the same 200 pounds that I started with, less about 2 ounces. Therefore, the 164 pounds of wood, bark, and root arose from the water alone."*

Early Experiments Neglected Mineral Elements

This experiment is of interest for several reasons. First, it was an outstanding experiment for its time. It caught public attention and was widely quoted. Robert Boyle in *The Sceptical Chymist* (1661) reports that he repeated it with several herbaceous plants and obtained similar results. Second, it was one of the earliest recorded physiological experiments with trees. Third, it reveals the level of science and scientific reasoning during the sixteenth century. Fourth, it was an accepted theory, for a great many years, and its ready acceptance delayed further investigation.

The conclusion that the willow tree was elaborated out of water alone, of course, as we know to-day, was incorrect. Van Helmont took the obvious factor, water, and ascribed the entire increase in weight of the tree to this one factor. He entirely disregarded the part played by the gases of the air and the mineral elements in the soil. The loss of 2 ounces of dry matter from the soil mass was considered of no importance.

Not until almost two centuries later did plant scientists come to a somewhat comprehensive understanding of the relation existing between green plants and the soil. During the middle of the nineteenth century, the mineral nutrition of green plants was intensively studied by European botanists and chemists. This led to the establishment of a number of fundamental principles. First of these was that green plants obtained the elements nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and iron from the soil. Many more mineral elements were found to be taken up by the roots of plants, but the above seven were described as the "essential mineral elements." Numerous experiments with herbaceous plants indicated that each one of the elements had a rather definite role in growth and development. The two ounces loss from the dry soil mass that van Helmont recorded, but disregarded in the interpretation of his results, had to do with the mineral nutrition of his tree—a phase of plant science on which our present great fertilizer industry is founded.

A Recent Research Project

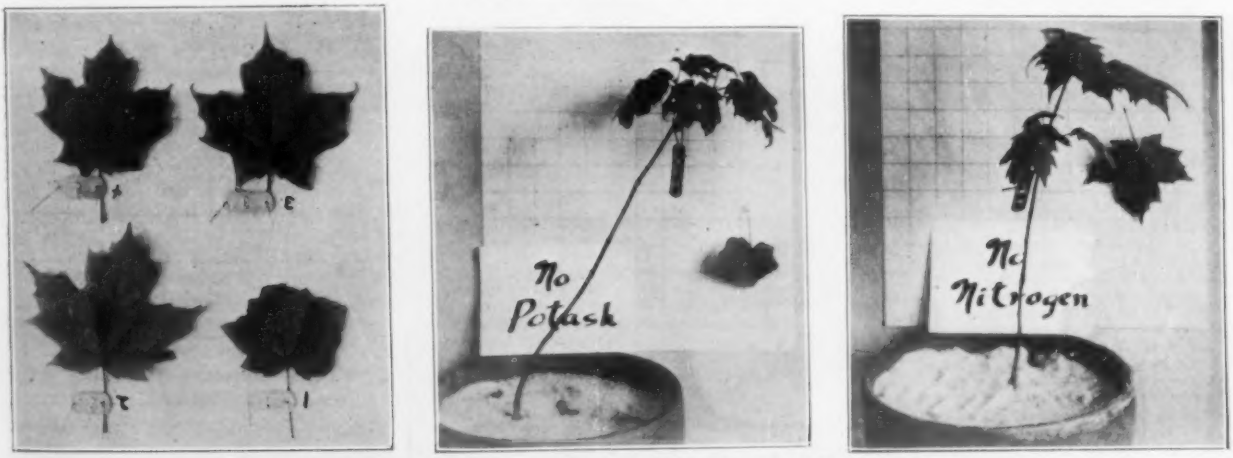
During 1928, the Bartlett Tree Research Laboratories, an organization devoted entirely to the care and restoration of our shade trees, was anxious to have the problem of mineral nutrition in shade trees investigated. This company, besides its regular work, had, some time previously, established laboratories for the investigation of fungus diseases and insect pests of shade trees, all of the work carried on by trained scientists in their respective fields.

A series of experiments was mapped out following the general procedure used in most of our state agricultural experiment stations when a new research project is undertaken. The first step was to see if the principles of mineral nutrition laid down by experimentation with herbaceous plants applied to shade trees. The favorite method available for this purpose is the growing of plants in pure cultures; that is, with the roots in a medium of known chemical composition. For ease of manipulation, with plants as large as three-year-old shade trees, it was thought advisable to use sand cultures instead of the usual water cultures often used in nutrition studies. A very high grade of white flint sand, relatively free of soluble salts, was employed in 10-inch flower-pots. The pots were set in enameled pans, and various water solutions of salts were added when the trees were planted.

The Make-up of the Nutrient Solutions Employed

The solutions were designed to give the shade trees a balanced diet of the seven mineral elements; a solution lacking nitrogen; one lacking phosphorus; and one lacking potassium. The first

*Russel, E. J.—"Soil Conditions and Plant Growth." 1921.



RESULTS OF EXPERIMENTS IN VARYING THE MINERAL NUTRIENTS OF SUGAR MAPLES

Left: sugar maple leaves from a tree grown in flint sand watered with (1) a solution lacking potassium; (2) with a solution lacking nitrogen; (3) with a solution lacking phosphorus; (4) with a "complete" mineral nutrient solution. Photographed September 18, 1928. Center and right: sugar maples growing in white sand watered with solutions lacking potassium and nitrogen respectively

solution is known as a "complete" solution and can be prepared by using suitable concentrations of such salts as calcium nitrate, potassium acid phosphate, magnesium sulphate, and ferric chloride. The solutions lacking one of the seven essential mineral elements were prepared by substituting potassium sulphate for magnesium sulphate if it was desired to have a solution lacking magnesium.

The question then arose of what shade tree species to use. It was impossible to try them all, so great care was exercised in selecting the tree. The requirements were: (1) a typical American shade tree; (2) a fast-growing tree; (3) a tree with relatively large leaves; (4) a tree that may have certain well-defined physiological diseases attributable to climatic or nutritional conditions. The sugar maple, *Acer saccharum* was eventually selected. It proved to be a happy choice, for the trees planted grew rapidly and formed large leaves, and many of them responded remarkably well to the various conditions of mineral nutrition imposed. The leaves, too, in some cases, showed evident signs of "leaf scorch." Three-year-old transplanted nursery stock was obtained early in the spring of 1928 and planted in the sand cultures on May 11.

How the Lack of Certain Chemical Elements Affected Growth

The photographs illustrating this article tell a more effective story than it is possible to state in word descriptions. The photograph of four typical leaves taken from representative trees growing in sand cultures lacking potassium, nitrogen, phosphorus and in a "complete" mineral nutrient solution, illustrate some of the major results obtained. The trees given a solution lacking potassium produced relatively few leaves, and these were small, of a dull-green color and often dried about the margins. The leaves from trees grown without nitrogen were characteristically a light yellow-green color. A deficiency of phosphorus, however, did not appear to detract from vegetative growth (leaf and wood) to any extent. In fact several of the trees in this solution were better leaved than those in the "complete" nutrient solution. This is an interesting fact, for in grain farming, phosphate fertilizers are used primarily, to influence the reproductive phase (production of flowers and fruit) of growth and are known to repress vegetative growth in that they hasten maturity. Briefly, it was found throughout this experiment that the responses shown by these sugar maple trees paralleled to a remarkable degree the responses which are generally obtained when herbaceous crop plants are grown under similar conditions.

From one season's work, it is too early to draw conclusions, but the indications are such that further research along these same lines appears promising. It must be borne in mind that a three-year-old tree has stored food in its tissues which has been manufactured and stored the preceding year. These foods and the elaborated embryonic structures, as the stems and leaves in the winter buds, have a profound influence on the growth responses during the growing season of the current year. That it was possible to secure definite responses to nutritional conditions imposed in this first season's trial of shade tree growth under highly unnatural conditions, is strong proof that the results are very encouraging. And it demonstrated, also, that trees and herbaceous plants may react similarly under like conditions of nutrition.

Bright Spots of Local Color from an Annual Report

HAPPENINGS in the field of municipal affairs may be no more diverting in Berkeley than elsewhere, but the staccato, news-feature fashion in which they are reported by a lecturer in Journalism of the University of California and presented for popular consumption in the annual report of City Manager John N. Edy certainly makes them seem so.

Even the humblest of the city's jobs, like that, for instance, of the rat catcher, or the poundmaster, seems rich in dramatic adventure when its affairs are retailed among the local color "fillers" scattered throughout the hundred-odd pages of the 1927-1928 report recently issued, which is the second annual report of Berkeley's affairs to be rendered in the new tempo.

Here is a sample of the incidental reading that is fitted in between conspicuously headlined tales of notable municipal achievements:

ODDS BODKINS
SOME ODD FIRES!

There were some odd fires in Berkeley during the fiscal year 1927-28.

Fire Chief George Haggerty, in his annual report, lists all fires, and the odd fire list includes:

A child's playhouse caught on fire. There was a fire in a culvert. A gas electric sign started to blaze. A housewife's roast burst into flames in the family oven. A scientific student called for help in extinguishing his smoke bomb. A bench in the park burst into flames, but the Chief does not say in his report whether it was an unextinguished cigarette or a youth making vivid love.

Even a summer house caught fire, three trees, a hay pile and an incubator in a hen house.' One Berkeley household mattress also suffered from an incipient conflagration.

Another item offered as relief from more weighty matters is:

ONE OPOSSUM DURING YEAR

The Berkeley poundman captured one opossum during the fiscal year. He also captured two rattlesnakes, fifteen skunks, and one squirrel.

Elsewhere it is recounted that he impounded 1,024 dogs and 1,113 cats, all of which were treated with due process.

Unusual things reported done include:

TREES DEHORNED
BECAUSE THEY MAR
BERKELEY VISTAS

And:

RATS? OH, RATS!
BERKELEY'S GOT
RAT CATCHER NOW

"Berkeley's got a full-time rat catcher. During the fiscal year, Dr. F. L. Kelly, City Health Officer, announces in his official annual report, the Health Officer conducted a survey and trapped 1,217 rats for examination. The inspection showed no plague danger from the rats."

One of the strangest items reported is this:

LADY-BIRD BEETLES
BATTLE FOR BERKELEY

The full account follows:

"In an effort to eradicate from the city the aphid pest, Superintendent of Parks H. A. Tibbetts imported and released during the fiscal year 1,750,000 lady-bird beetles. 'Their work has been noted frequently this year,' says Tibbetts in his annual report. Nothing appears in the report as to who counted the 1,750,000 lady-bird beetles. Neither Tibbetts in his report, nor Fire Chief George Haggerty in his report, ventured to estimate how many times during the year individual members of the lady-bird army were interrupted by Berkeley children during their war on aphids, and forced to listen to the lines of 'lady-bug, lady-bug, fly away home; your house is on fire, and your children will burn!'"

The wierdest situation faced by the City Engineer, Colonel A. J. Eddy, during the fiscal year, according to accounts, was the slow but persistent sliding of a section known as Cragmont Swamp. It has still to be stopped. City Garbage Manager O. L. Larson is reported as having among the bright moments of his fiscal year the salvaging of a lady's slipper, one diamond ring, a crate of lettuce, two pairs of scissors, and a quite intrinsically priceless parrot cage. These "finds" were somewhat offset by the keys to the First National Bank, a share of stock in the American Trust Company, and a supply of dahlia bulbs still reported lost in the garbage. These will doubtless still be found, for another headline announces that it is:

USELESS TO LOSE
ANYTHING IN
BERKELEY

The reason given is that Chief of Police August Vollmer is too efficient to permit things to stay lost. Of lost property totaling $34,611 during the fiscal year, articles totaling a value of $32,147 were found by the police and returned.

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Asphaltic Types for Special-Service Roadways

Economical Construction Harmonizing with Use of Terrain

THE general adaptability of bituminous materials for various types of roadway surfaces is illustrated by the following brief descriptions, and the accompanying photographs of the completed surfaces.

A Cemetery Road

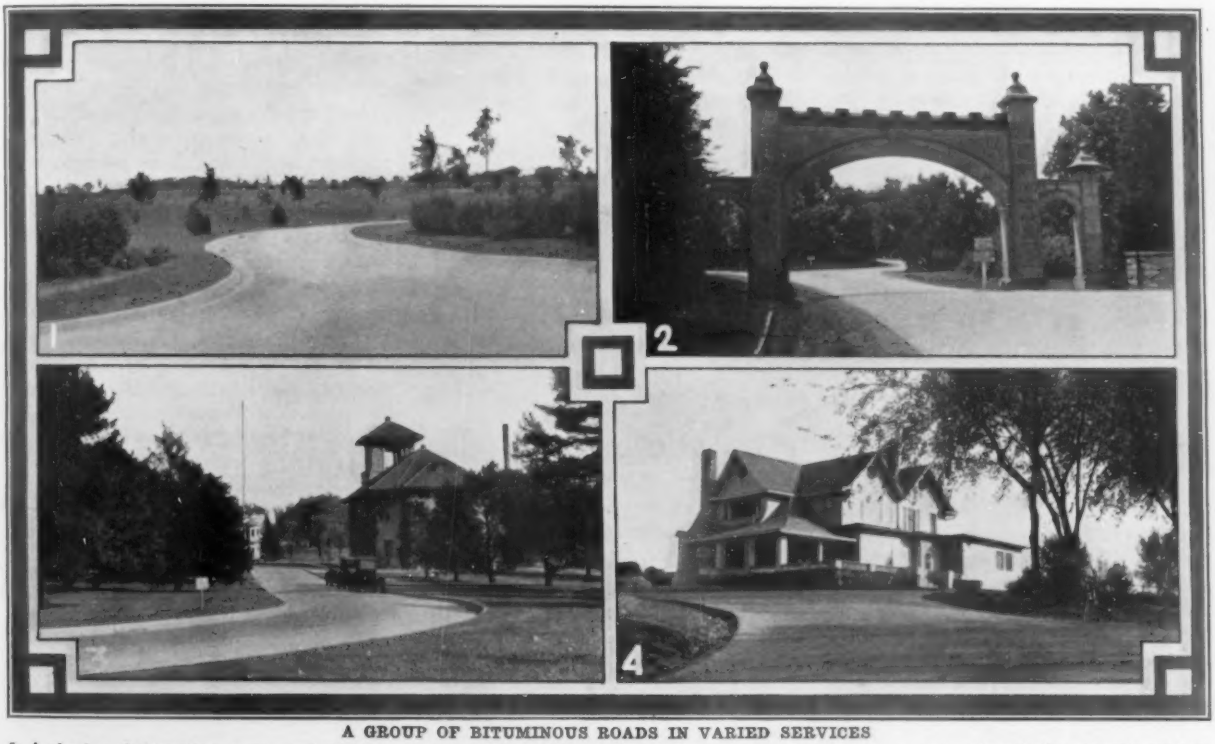
The Memorial Cemetery Association has developed many cemeteries located near the larger cities in Kansas and neighboring states. These cemeteries are designed with the purpose of systematically fitting them into the topography of the country in which they are located; and they are noted for the perfection of arrangement and the thorough and thoughtful manner in which they are maintained. The drives in these cemeteries were originally constructed, in most instances, of waterbound macadam. At some points where these macadam surfaces proved to be unsatisfactory, either from the maintenance standpoint, or from a desire on the part of the management of the Association to have a roadway surface blend in more harmoniously with the elaborate surroundings, the drives have been surfaced with various types of bituminous construction. The accompanying photograph of one of the drives in Memorial Park Cemetery at Wichita, Kans., shows how such drives can be made to blend tastefully into the general plan of the development. The drive consists of an old macadam surface covered with a Texaco sheet asphalt top. This work was done by the H. T. Ritchie Co., of Wichita, C. A. Forter, of this company, being superintendent in charge of construction.

A Park Drive

The drives in Gage Park at Topeka, Kans., were originally constructed of broken stone and cinders, and while the park was new and the traffic light, these served their purpose satisfactorily. As the park developed and increased in popularity, the traffic became so heavy that the rock and cinder drives could not satisfactorily carry the traffic, and the Park Department decided to improve its drives. After thoroughly studying conditions, they decided to surface the drives with an asphaltic concrete pavement. The accompanying photograph shows one of these drives after having been surfaced with 4 inches of Texaco asphaltic concrete. The work was done by the Kaw Paving Co., of Topeka, under the direction of the City Engineer and the Commissioner of Parks.

A Campus Roadway

Washburn College, Topeka, is especially known for the beauty of its campus and the convenience and arrangement of its buildings. When the campus was first laid out, the drives were paved with waterbound macadam. As the College grew in importance, the waterbound macadam drives became less satisfactory, and in 1928 the Board of Directors decided to improve the drives and selected asphaltic concrete as the type of material to be used. The work was done by the Kaw Paving Co. under the direction of the Engineering Department of the College, and the accompanying photograph shows how the asphaltic concrete surface blends into the general plans for the development of the Washburn campus.



A GROUP OF BITUMINOUS ROADS IN VARIED SERVICES

1. A sheet asphalt surface over a waterbound macadam drive in Memorial Park Cemetery, Wichita, Kans. 2. A 4-inch asphaltic concrete surface laid on a broken stone and cinder drive at the entrance to Gage Park, Topeka, Kans. 3. A waterbound macadam drive surfaced with asphaltic concrete at Washburn College, Topeka. 4. The dusty cinder drive of the Country Club of Topeka, surfaced with asphaltic concrete

Drive Leading to a Country Club

The drives leading up to the Country Club at Topeka were originally constructed of cinders. They were dusty in dry weather, and washed badly in wet weather, and the Board of Directors decided to eliminate these conditions, at the same time improving the appearance of the grounds. It was decided to cover the old cinder drives with an asphaltic concrete wearing surface, as illustrated.

Clearing Snow from 159 Miles of Street

By EDWARD M. HUNT

COMMISSIONER OF PUBLIC WORKS AND CITY ENGINEER, PORTLAND, MAINE

PORTLAND, MAINE, is a city having an area of about 22 square miles and a population of about 77,000. It has 159 miles of streets from which it removes the snow so that the roadways can be used in the winter by motor vehicles. This work is done under the direction of the Department of Public Works.

The roadways vary in character from paved streets with paved sidewalks in the compactly built-up areas of the city, to country roads with earth sidewalks or no sidewalks in the suburban areas. In the compact parts of the city, in accordance with city laws the abutting owners or occupants clear the sidewalks of snow by shoveling it into the roadways. In the suburban areas, the city clears the earth sidewalks of snow with wooden sidewalk plows. Ten of these plows are used, each drawn by one or two horses, according to the depth of the snow and the difficulty in drawing the plows. The area in which sidewalks are plowed is divided into ten routes, one for each plow. All the plows start as soon as possible after a snowstorm is over and quickly break out footpaths on the earth sidewalks.

Equipment

In the most compact parts where the traffic is heaviest, the snow is removed and taken away from about 6 miles of roadways by the city. The equipment for this work includes two mechanical snow loaders, which take the snow from the ground and load it into trucks using 10 to 14 trucks with bodies of 7 cubic yards capacity for each loader. These trucks are hired and each loader will load about 30 trucks per hour. They work day and night until the snowfall is cleared up. The snow is disposed of by dumping it into the waters of the harbor at convenient points. In this work it is an advantage to be situated on the seashore as is Portland. In addition to the removal of snow by mechanical loaders, it is customary to employ all available horse-drawn sleds. Each sled holds about 5 cubic yards and is drawn by two horses. About thirty of these rigs, ten owned by the city, and twenty hired, are usually available. They are loaded and unloaded by hand and haul the snow to convenient points for disposal.

Work of Street Railway

In addition to the streets from which the city removes snow, the street-railway company hauls off the snow from several miles of streets on which there are street-railway tracks. The street-railway company uses hired trucks and horse-drawn sleds for this work and loads them by hand.

Plowing Outfits

The snow is plowed from about 153 miles of streets and roads in addition to the 6 miles from which it is carted away. For this work the city has 12 snow-plowing outfits as follows:

Three 10-ton Caterpillar tractors with four 10-ton V-type wooden snow-plows

One 2-ton 24-horsepower crawler tractor with one V-type steel snow-plow

One 3½-ton truck with two V-type wooden snow-plows

Five 2½-ton trucks with six steel straight-blade snow-plows, each 10 feet long

One hired 1½-ton truck with one steel straight-blade snow-plow 8 feet long

One wooden V-type snow-plow on runners, to be drawn by six horses

It will be noticed that there is one spare 10-ton plow, one spare V-type truck plow, and one spare straight-blade truck plow; these are used as substitutes for plows laid up for repairs.

Organization

For snow-plowing, the whole area of the city is divided into districts or routes, one for each snow-plowing outfit. The U. S. Weather Bureau furnishes the Department of Public Works with warnings of each approaching snowstorm. When such warning is received, each snow-plowing outfit is made ready and the operators stand by. When the snowfall gets to be 3 inches deep, all the plows start to work, each in its own district or route. The plows are operated continuously during the storm, with several shifts of operators, if needed, until all the roadways have been plowed.

The truck plows are used in the compactly built-up districts, where the snow falls evenly and does not drift to any extent. They clear a width of about 8 feet on each passage of the plow. By frequent trips, they prevent the accumulation of any great depth of snow and keep the roadways constantly usable.

Work in Suburban Districts

In the suburban districts where the sweep of the wind is unbroken, snowdrifts of great depth form rapidly in some parts of the roadways. In these districts, where it is necessary to have plowing outfits that can break through great depths of snow, the 10-ton tractors with 10-ton plows are used. These outfits have been found to be powerful and dependable and well adapted to heavy snow-plowing on the highways. The plows clear a width varying from 12 feet in hard plowing to 30 feet in easy plowing at each passage of the plow. By going over the road several times, any desired width within the limits of the roadway may be obtained. In snow-plowing in Portland, it has been found that the snow frequently drifts so deep and hard that the full power of the 10-ton tractor is needed to force the plow through. Snow-fence is used where practicable, to prevent drifting on the suburban roads.

Experience in Portland leads to the opinion that heavy tractors and tractor plows for the country roads where deep drifts are likely to form, and trucks and truck plows for the city streets, is the best combination for a city where part of the area is closely built-up and part is open farmland.

Other Snow-Removal Articles

Articles of varying length covering the snow-removal organizations and the methods used in the following cities appeared in the February issue of THE AMERICAN CITY: Springfield, Mass.; Hazleton, Pa.; Watertown, N. Y.; New York City; Ann Arbor, Mich.; Beloit, Wis.; Kenosha, Wis.; Brookline, Mass.; Brockton, Mass.; Lansing, Mich.; in January, Columbus, Ohio; Erie, Pa.; Boston, Mass., and Oshkosh, Wis.

FORWARD STEPS

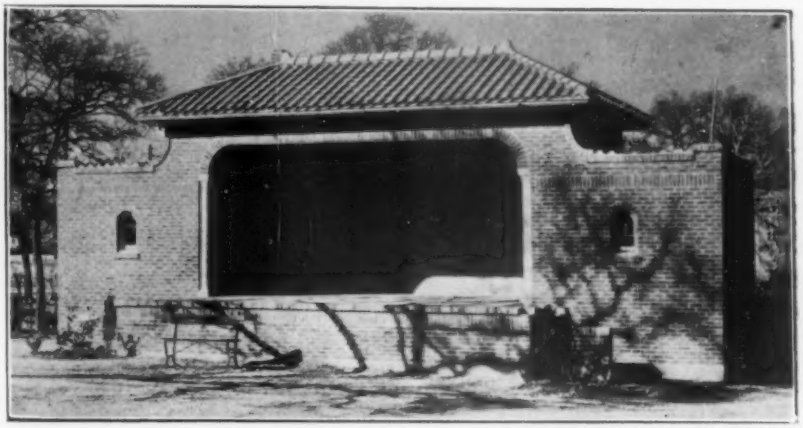
Reported by

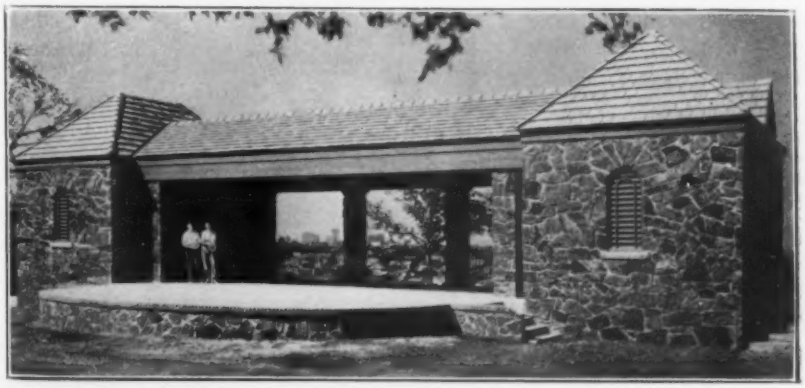
Municipal Officials, Chamber of Commerce Executives, and Others

Every Park Shelter a Little Theater

FORT WORTH, TEXAS.—To the familiar combination of shelter house and comfort station, the park authorities in Fort Worth, Texas, some time ago brought a third element which has broadened the practical usefulness of park buildings and at the same time brought to them a new attractiveness in architectural design. That every playground and other public play area should have its dramatic program is one of the accepted tenets of progressive recreation directors; that every one should have its little theater has not been conceived a practical possibility till now. But such is the promise of the Fort Worth design, and in that city, at least, every park shelter will in future be so designed as to include a stage for the young people's and children's theater groups of the neighborhood.

The shelter house and little theater buildings already in use and herewith illustrated, were designed by Hare and Hare, city planners, Kansas City, Mo. Plans and specifications were prepared and work supervised by Wilford S. Bogue, architect, of Fort Worth. The Arnold Park building was erected at a total cost of $3,703.83. It has a stage 26 feet 6 inches wide, 18 feet deep and 9 feet high, with off-stage dressing-room and comfort station space. It has been in use for something over two years and during that time has been the center of much dramatic activity on the part of the children and young people of the neighborhood.



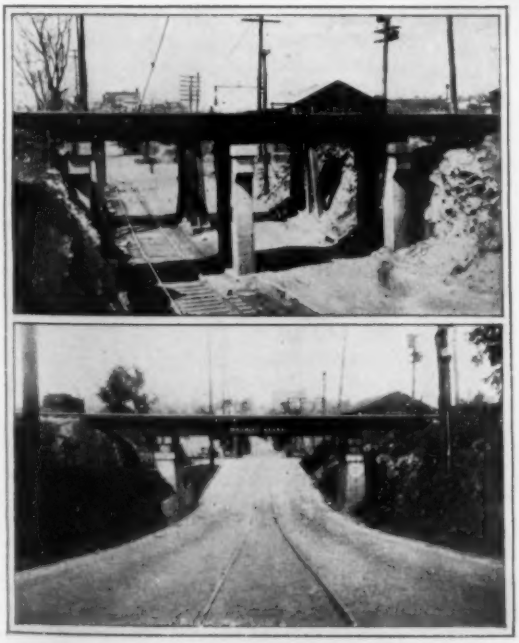


A STAGE IS A FEATURE OF EACH OF THE ABOVE PARK SHELTERS IN FORT WORTH, TEXAS

The building in the upper view is in Arnold Park, the other in Hillside Park

The Hillside Park building, of later construction, represents a total expenditure of $6,513.38. It is large and has a more efficiently managed off-stage arrangement. The total width is 64 feet. The semi-circular apron-construction stage is 39 feet in width and is flanked by spacious dressing-rooms located in front of the retiring-rooms.

GEO. C. CLARKE,
Superintendent of Parks.



A RAILROAD BRIDGE OVER AN OUTLYING STREET IN LYNCHBURG, VA., BEFORE AND AFTER WIDENING THE HIGHWAY

Lynchburg Improves Annexed Roadways

LYNCHBURG, VA. — When Lynchburg annexed more than 9 square miles in 1926, consisting of partially developed territory, about 5¾ miles of street were acquired which had been a part of the state highway system. These were narrow roads with one-way bridges, and the municipality undertook to make several improvements to these, which were completed during 1928.

Among the outstanding projects in this street improvement program was the rehabilitation of Campbell Avenue. That thoroughfare had been paved with an 18-foot driveway, partly of penetration macadam and partly of rubble block. This driveway was widened to 32 feet by the city and given an asphaltic concrete surface and curb on both sides of the highway.

The street-car track which formerly extended along one side of the roadway and which was unpaved for approximately one-half of its length, was moved to the center of the street and paved so as not to constitute a traffic obstruction.

KARL V. OGDEN,
Chief Clerk.

The Come-Back of a Vermont Town That Had Been Hard Hit

LYNDONVILLE, VT.—Early in the morning of January 3, 1922, this community was startled by an alarm of fire in Lyndon Institute. Thompson Hall, the main building, was leveled. A meeting of the trustees was called at 10 o'clock that morning and $30,000 was pledged then and there. A committee to solicit funds and to have full charge of rebuilding was selected. About $125,000 was raised by subscription, and the present structure was erected at a cost of $200,000. It was dedicated December 21, 1922.

That summer there was a disastrous strike of the men employed in the railroad shops. Many families moved from town, and business was generally unsettled as a result.

On January 21, 1924, occurred the big fire in Lyndonville, destroying a hotel and four large business blocks. Several lives were lost in one block. Meetings of interested citizens were held immediately and steps were taken to buy up the burned sites to prevent their being covered with cheap and unsightly buildings. In this undertaking E. A. Darling was of great financial assistance. It seemed best to erect a business block first. The Lyndonville Realty Co. was incorporated, and sufficient stock was sold to warrant the officers in undertaking to build that summer. A substantial brick block was opened for business in January, 1925. The block cost about $110,000.

In the winter of 1926-27 many of the citizens began to take a decided interest in the building of a hotel. Meetings were held, and the Lyndonville Hotel Co., Inc., was organized and stock sold. Work began in the spring of 1927, and the Darling Inn was opened in June, 1928. It is a very finely appointed hostelry and is named in honor of Mr. Darling, who for many years was associated with the Fifth Avenue Hotel, New York City. It cost about $225,000.

While the Darling Inn was being built, a few citizens felt that the time had come to round out the rebuilding of Lyndonville by the erection of a building on a corner in the burned business section. Accordingly, a new company called the Community Building Co., Inc., was organized. It was decided to build a garage and salesroom. Stock was sold and a substantial brick building was erected and opened in March, 1928. It is one of the finest buildings of its kind in the whole "north country" and cost nearly $100,000.

Such in brief, is the story of the "come back" of Lyndonville. A few men had a vision of what might be done, they dared to follow it, and with the help of many citizens it was realized. The committee for the rebuilding of Lyndon Institute and the official boards of the Lyndon Realty Co., the Lyndonville Hotel Co. and the Community Building Co., were made up largely of the same names. The Lyndonville Board of Trade did a good work in arousing public interest in the work of rebuilding. Dr. H. M. Smith was and still is President of the Board. The rejuvenation of Lyndonville is a triumph of community spirit and enterprise.

O. D. MATHEWSON,
President, Lyndonville Rotary Club.

THE INN AT LYNDONVILLE, VT., REBUILT THROUGH COMMUNITY EFFORT AFTER A DISASTROUS FIRE IN THE BUSINESS SECTION

Danville Tells the Story of Its Municipal Building

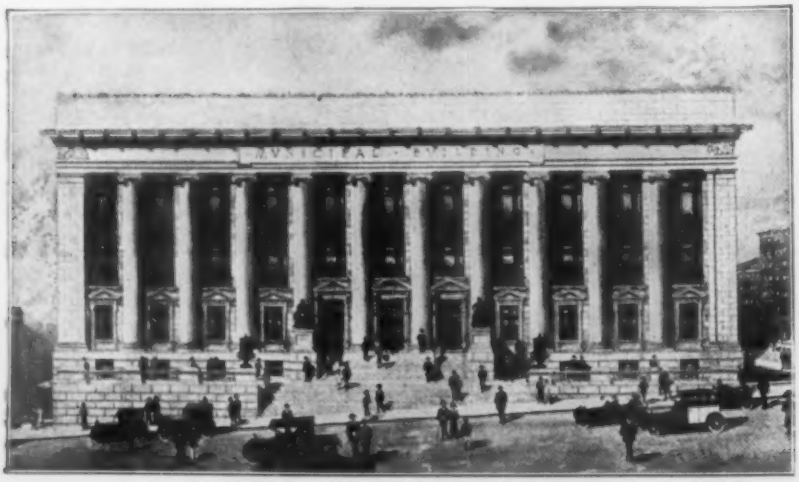
DANVILLE, VA.—Although the new municipal building in Danville was accepted formally by the City Council more than a year ago, the story of its modern facilities and their cost should be of interest to other municipalities of about the same size.

The four-story stone building was financed by a $350,000 bond issue voted by the people, $100,000 derived from the sale of the old municipal building, and $111,266 in appropriations from current revenue. Details of the project were handled by a committee of five consisting of the President of the City Council, the City Auditor and Clerk, and the Chairmen of the Public Works, Public Welfare, and Finance Committees.

On the first floor is the Health Department with fully equipped laboratories and clinic rooms, the Police Department, the Police Court, and the general assembly room. The second floor is occupied by the City Treasurer, the City Tax Collector, the City and State Commissioner of Revenue, the Manager of the Water, Gas and Electric Departments, the Collection Department, and the City Engineer.

Official headquarters on the third floor are those of the City Purchasing Agent, the City Auditor and Clerk, the City Council, the Superintendent of Schools, and the City Attorney. There are several vacant offices for future use.

The fourth floor is utilized by the Clerk of Courts, the Clerk's filing room and the Recorder of Deeds division, the offices and court rooms of the Judge of the Corporation Court, together with the witness and detention rooms in connection with this court, and the offices and detention rooms



THE NEW MUNICIPAL BUILDING IN DANVILLE, VA.

of the Juvenile and Domestic Relations Court.

There are 75,000 square feet of floor space in the building. The woodwork is finished in walnut, the offices and rooms are furnished throughout with walnut furniture and the metal filing equipment is finished in walnut. Itemized, the cost of the new building was $481,926 for the building proper; $61,401 for furniture and equipment; $12,584 for improvement to grounds, walls, etc.; and $5,355 for miscellaneous expense; making a total of $561,266.

CHARLTON B. STRANGE,
City Auditor.

A New World War Memorial in Grand Rapids Made Effective by Ingenious Illumination

GRAND RAPIDS, MICH.—The memorial recently erected in honor of our World War heroes consists of a pair of granite pylons which rise 36 feet above a spacious plaza. Upon the sides of these pylons are bronze tablets bearing the names of the men and women who died in their country's service. The pylons and plaza were financed by popular subscription through the efforts of The American Legion. The city undertook as its contribution to the scheme the provision of an effective setting—one which would enhance the attractiveness of the pillars by day and by night. This has been provided by the complete re-design of Fulton Park, in which the memorial has been placed, and the construction of an electrically lighted color display fountain set into a mirror pool.

The Park Department faced a unique problem in undertaking to build and electrify a pool which would maintain a smooth surface for the reflection of the pillars. There could be no central obstruction, and it was therefore necessary to submerge the fountain and also the lights which illuminate the fountain sprays. We had the assistance of Frank J. Fitzgerald, of the General Electric Company, and through him we obtained plans of illuminated fountains from a number of other cities. But nothing meeting our particular requirements had been worked out elsewhere.

We placed the submerged projectors, of which there are seven, in a circular pit about 6 feet in diameter in the center of the pool. The rim of this pit is 3 inches below the surface of the water. The depth of the water in the pool outside the pit is from 8 to 15 inches, and in the pit it is 3 feet deep. The depth of the water above the projectors is 6 inches. The bottom of the pool is black. It was constructed of cement mixed with lamp-black and it is impossible to tell the depth of the water by observing it from the walk which surrounds the pool.

The projectors contain 500-watt lamps, which illuminate the central spray and the outer sheaf. The central spray can be made to play to a height of 35 feet and the outer sheaf to a height of 8 feet. The pressure is obtained directly from the city water-supply.

The lights, with the colored lenses, work on a sign flasher, and various combinations are obtained with these colored lenses. We have three colors—green, red and amber. A white light is placed directly under the central spray. Our light program gives a complete change every four minutes, using the various combinations and the single colors.

The light control and sign flasher are housed in an underground comfort station, located at the side of the park, about 200 feet from the fountain. The fountain sprays and drain are controlled from a manhole under the walk, adjacent to the pool. The projectors are vented to the outside air by means of rubber-hose connections from each light to a central pipe, which runs to the manhole that houses the water controls.

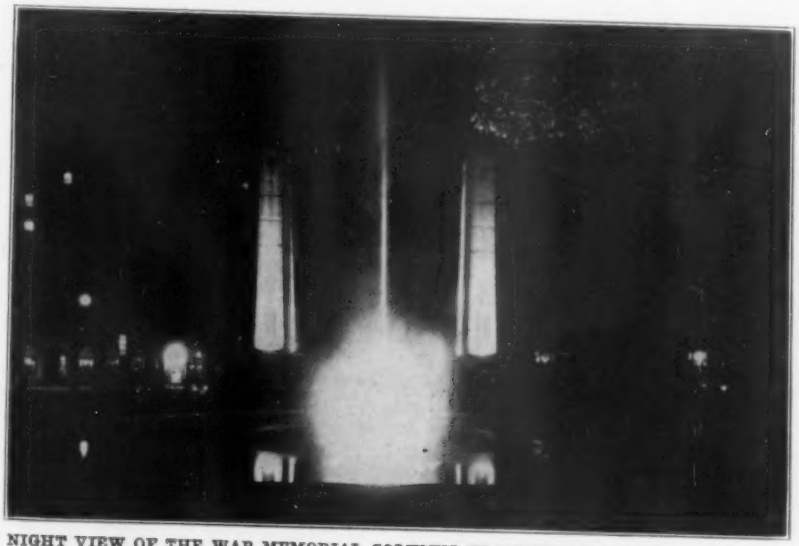
The mirror pool, including the lights and fountain, cost approximately $3,500 and was built by the Park Department on the day labor plan.

L. HENRY GORK,
Landscape Architect, and Supt. of Parks.

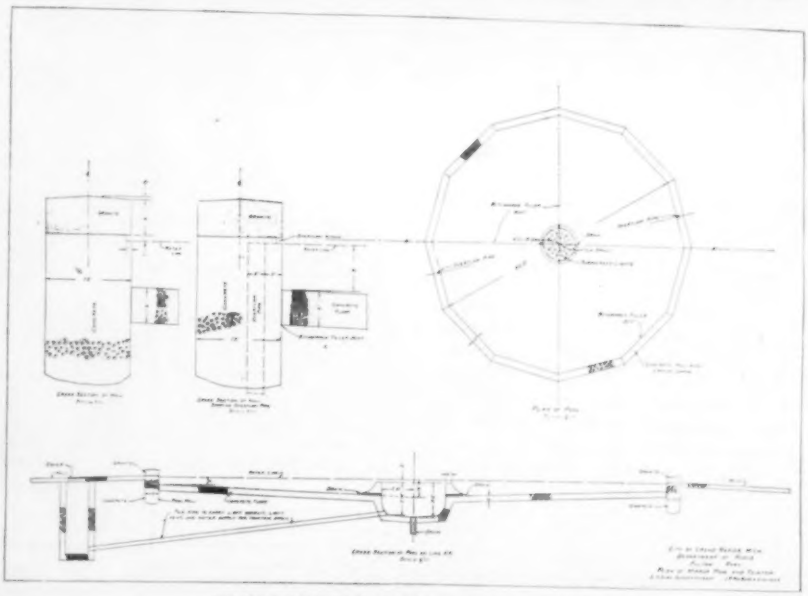
A New Municipal Building Worthy to Carry on a Fine Old Tradition

ALTON, ILL.—Alton's new City Hall, built at a total cost of $250,000, is a beautiful and commodious structure occupying an eminence overlooking the Mississippi. It is in every sense worthy to be the capitol of a city of reawakened, progressive, loyal citizenry, as ours is. And it is a worthy successor to the building which burned down in 1924.

The new City Hall was financed by a bond issue of $200,000. This issue was sold at a premium, and with an accretion of interest up to the time of its complete expenditure, totaled $224,000. This sum was augmented from other sources to the approximate total of $250,000, so that at the end of the fiscal year there was no hangover indebtedness. The building contains nine office rooms on each of the two upper floors, besides the necessary public toilet rooms, a city court room, an



NIGHT VIEW OF THE WAR MEMORIAL COLUMNS IN FULTON PARK, GRAND RAPIDS, MICH., SHOWING REFLECTION IN MIRROR POOL WITH ILLUMINATED FOUNTAIN



PLAN OF MIRROR POOL AND FOUNTAIN

THE NEW CITY HALL IN ALTON, ILL.

auditorium seating 600 people, and the council chamber. The basement floor houses the Police Department, the Police Court, the jail, and five additional offices. The architects were N. S. Spencer and Son, Chicago, and the builders J. J. Wuellner and Sons, a local firm specializing in large scale construction work.

The old City Hall and Markethouse, as it was termed, was originally a creation of architectural beauty and stateliness almost unique in the section, and with a brilliant history which began in 1858, the year of its completion, with the last of a series of debates between Lincoln and Stephen Douglas. President Filmore, Charles E. Hughes, Champ Clark, "Silver Dick" Bland, and W. J. Bryan were some of the other men of national reputation who have appeared on its platform. That building was erected at a cost of $40,000, a prodigious sum to be expended in those days for such a purpose. In addition to its functions as city hall and market building, it housed the Fire Department and the Post Office. A section of its space was devoted to the Public Library, and after the City Court was organized in 1859, its headquarters were there. A fire some forty years ago marred the original structure, the beauty of which was not kept in the reconstruction. When the building was practically destroyed in 1924, it was after it had been vacated preparatory to remodeling and reconstruction work designed to restore to it its original architectural charm.

An interesting situation arose at the time that steps were taken for replacing the illustrious old building with the new one which was planned to occupy the same site. Injunction proceedings were started to prevent this use of the land which had been originally dedicated as public commons, although it had been occupied for nearly sixty years by a city hall. The courts sustained the decision, and the present site of the new building was purchased with the insurance money collected on the old building.

The old site now is being used as a public parking place, providing some relief from downtown traffic congestion. At the last session of the General Assembly of Illinois a bill for erection of a monument to Lincoln and Douglas on the site narrowly failed of passage and efforts for its approval will be renewed, in the hope that the site consecrated by their presence will stand as a memorial to two illustrious sons of the state.

THOMAS BUTLER,
Mayor.

Fox Valley in Illinois to Regulate Its Growth Through a Regional Federation

GENEVA, ILL.—With the purpose of developing and beautifying the valley in a systematic manner, a group of business and civic leaders recently organized the Fox Valley Federation.

A budget for the operation of the Federation will be established from subscriptions. It is the aim of the organizers of the Federation to work in close harmony with the Chicago Regional Planning Association. It is hoped to enroll at least 3,500 members in the Federation, which is to be the Chamber of Commerce of Fox Valley.

Just what the Federation hopes to accomplish is set forth in the preamble to the by-laws, in the following definite terms:

"That part of the Fox River Valley in Illinois which lies in Kane County, together with that portion of Kendall County that is tributary to Aurora, and possibly that part of McHenry County tributary to Elgin, has many interests in common:

"The preservation and beautification of the river itself.

"The welfare of the people who live in the valley.

"Increase in population.

"The zoning of territory in preparation for the influx of population which is inevitable, regardless of any effort on our part.

"The guidance of this influx.

"Location of new industries and the protection of the common interests of these industries in freight rates, terminal facilities and utility service.

"Proper cooperation with the Chicago Regional Planning Association.

"Intelligent study of highway improvement, location and widening.

"Intelligent cooperation between the valley municipalities in beautifying and improving highways.

"Proper methods of traffic control.

"The proper presentation of the merits of the Fox River Valley to the outside world.

"Acquisition and dedication to the public of park areas contiguous to the river.

"Development of more cordial relationship between the several municipalities and their inhabitants.

HARRY C. HANSON,
Mayor, Geneva, Ill.

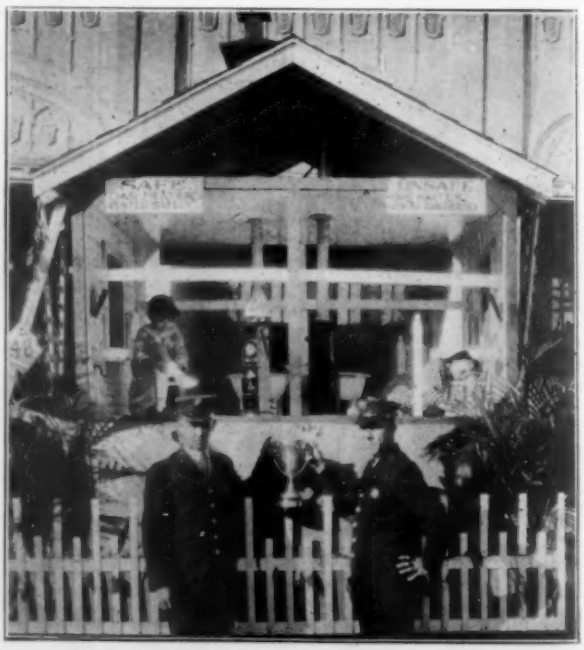
Fire Department Wins Cup for Safety Float

BATON ROUGE, LA.—The Baton Rouge Fire Department's educational float, stressing the preventive phase of fire prevention work, was awarded second prize in the recent Safety Week parade held in this city.

Illustrating the danger of using gas heaters vented improperly, the float attracted much attention. Since the installation in 1927 of natural gas, replacing artificial gas, in Baton Rouge, there have been a number of fires caused by improper venting of water heaters which use gas for fuel. The natural gas, generating more heat than the artificial variety, has increased this hazard, and the Fire Department consequently has called attention to this fact on numerous occasions. The float was designed to bring out the danger both of fire and of asphyxiation from unconsumed gas.

In addition to receiving the silver loving cup for the float, the Department's team won sixth place in the First Aid contest.

R. A. BOGAN,
Chief, Fire Department.



THE FIRE DEPARTMENT'S FLOAT IN THE BATON ROUGE SAFETY PARADE, AND THE TROPHY THAT IT WON

Making a Safe and Economical Water-Works Distribution System

By C. L. EHRHART

SUPERINTENDENT, COUNCIL BLUFFS CITY WATER-WORKS, IOWA

WHILE water departments may use various methods in securing their supply and in pumping or treating it, practically every water-works serving a municipality has a distribution system more or less similar to its neighbors and with the same problems of construction practice. It is assumed that the design of the proposed project is according to good practice and that the materials have been ordered.

Handling of Pipe

Under no circumstances should pipe be allowed to drop or swing against anything that will cause it to crack. It should be handled by means of skids, or, better yet, by derricks or cranes which can swing it clear of all obstacles and deposit it without undue jar wherever required. In handling small pipe, the best method is to use a derrick having a 10-foot boom and mounted on a heavy truck. This derrick is of a type generally advertised, is inexpensive to buy, and can be used for handling many other things than pipe. Such a derrick can even be mounted on the side of a freight car, if it is not convenient to mount it on a truck, and then taken down after the car is unloaded.

As soon as the pipe is lifted from the pile, it should be sounded for defects, then swung around and lowered. It is not always possible to lower the pipe directly to stock piles, but several lengths can be laid crosswise on the truck back of the derrick and taken over to the stock pile and put in place quickly. Probably the handiest and neatest stock pile is one in which the pile alternates in the placing of the bell-and-spigot ends, with each layer turned 90 degrees in direction. Such a pile is not liable to slip, causing breakage or accident, and is handier to check. Many times the pipe can be loaded directly to the trucks or trailers and taken to the point where it is to be laid. In the case of large pipe it is often economical to have some company equipped with large stationary booms do the handling. In Council Bluffs we are fortunate in having a bridge company which will unload large pipe to our trucks and trailers at $5 per car.

Delivering Pipe to the Job

It is economical to deliver pipe to the job by a truck pulling a trailer where possible. Trailers are rather inexpensive affairs, and we believe no water department should be without one or more. All that is necessary to get a good trailer is to buy the running gear of a truck which has been junked, and then place a tongue in it, which will allow it to trail. We have been able to haul from four to five tons on a single trailer in addition to the pipe on the truck.

Out of Sight—Out of Mind

In the past there seems to have been a tendency to use less care in the construction of the distribution system than was exercised in the construction of any other part of the water-works system. This may have been due to the fact that the work was soon covered and out of sight, or to lack of experience in good construction practice. Whatever the reason, it has resulted in much trouble cropping out at a later date, often at the most inopportune times. In many cases where the blame for a break has been laid on the pipe, investigation has proved the fault to be poor construction practice.

The modern tendency is to use more care in pipe laying, thereby insuring fewer cases of trouble with the consequent disturbance to service and the useless expense of the repairs.

In removing pipe from the truck or trailer to the ground, care should be taken that there is no chance of breakage. On dirt streets it is possible to slide the pipe off the end without damage, but on paved streets such a practice cannot be carried out. We have found it best to lower pipe on paved streets with the above-mentioned derrick mounted on a truck. As this truck is also used in lowering the pipe into the trench, it is not necessary to string the pipe with the bell ends one way, for it is a small matter to swing a pipe around when it is suspended from the boom. We have also had occasions when it was not advisable to string the pipe at all, but to pile it on the parking at convenient locations. In this way it can be stored longer without complaint from the public and without the danger encountered by stringing the pipe in the street. As the pipe has to be picked up by the truck for placing in the trench, the short run necessary to take it from the pile to the trench does not noticeably hold up the work, as would be the case in handling by hand.

Excavation

With the material on the ground, the next operation is making the excavation. Some of the larger cities are fortunate enough to have trenching machines, but in the smaller or medium-sized cities, much of this work is done by hand. In either case the trench should be dug wide enough to allow the backfilling material to slip past the pipe and fill the lower quarters below the pipe. If a ditch is cramped for width, the backfilling material is likely to rest on the top of the pipe, causing an undue strain and possible breakage. If the trench is wide enough to allow proper backfilling, it is also wide enough to work in comfortably. In the northern part of the United States the depth of the trench is generally regulated by the frost line, the cover being sufficient to insure against freezing. This cover is generally enough to properly cushion the pipe against excessive weight and the consequent strain.

Proper tools should be provided for the excavation work. In cases where it is necessary to go through paving or hard dirt surface, we have found that the cut can best be made with busters or spades operated by compressed air. The compressor is one of the handiest tools the water-works man can have, as it takes care of a great many hard jobs which are expensive to handle by hand. While it is better to have a compressor of at least 100 cubic feet capacity, smaller ones may be purchased and mounted on a truck and driven from the drive shaft. It is often possible to make a compressor by converting a second-hand gasoline engine. The first one ever operated by the writer was made from an abandoned six-cylinder Buick engine mounted in line and driven by another gas engine. The larger compressors should be purchased mounted, or mounted on the running gear of a second-hand truck and used as a trailer.

To avoid undue jar to the compressor, the running gear should have good springs and at least solid tires if pneumatic are not available. All the tools in excavation work should be kept in good condition, and the spades and shovels should be of a light high-grade steel. The best shovels and spades are the cheapest in the long run and are not so tiring to the workmen, because of their lightness.

The trench which is to receive the pipe should be graded with a string line the same as for sewer work, making the high and low points come at hydrant locations, if possible. This will insure that the sediment can be blown out at the low points and the air taken out at the high points, preventing the line from becoming air-bound. If the walls of the trench being dug are dry and of the right material, no bracing will be necessary. Sandy or wet material, however, will require bracing in order to make the trench safe and allow the placing of the pipe. Water in the trench should be removed before attempting to place any pipe. Formerly this was taken care of by hand trench pumps, but the gasoline-driven units are now so inexpensive that no pipe-laying crew is completely equipped without them. Clear water may be removed by motor-driven centrifugals to good advantage. In laying out trenches it is a good plan to keep at least five feet away from other parallel trenches, if possible, so avoiding the chance of the ditch on the side near the parallel trench caving in. Such cave-ins generally come without warning and are apt to be serious. When it is necessary to roll the pipe into the ditch, it is customary to pile all the dirt on one side of the trench. This sometimes creates cave-ins because of the excessive weight of the dirt. Where the pipe is handled by derricks or cranes, it is not necessary to keep one side of the trench clear, but it is better to divide the dirt and thus spread the weight on both sides of the ditch. In the past it has generally been customary to dig the bell holes as the pipe was placed in the trench. Where portable trucks are used, it is possible to lay from 10 to 12 lengths per hour, so the bell holes cannot be dug after the pipe is in the ditch without delaying the work. Under such conditions it is better to measure off the bell-hole locations and put enough men to work digging bell holes so as to insure no delay in the pipe laying.

Laying Pipe

With the trench ready to receive the pipe, it is important that the laying proceed as fast as possible. With the portable truck derrick the pipe should be raised with the sling around the middle, so as to keep it balanced. As soon as it is clear of the ground, the pipe should be given a final sounding to prevent defective or cracked pipe from entering the ditch. The derrick is then run alongside the ditch, the boom swung around and the pipe lowered. In the meantime one man should clean and dry the bell of the last pipe laid, very thoroughly, as many defective joints are caused by dirt or foreign matter. When the next pipe is lowered, the same man should also clean the spigot end. He should then place a strand of hemp around the pipe and guide it into place when it is sent home. The best hemp, to our notion, is of the dry braided type, and two strands are usually sufficient. Should the pipe pinch to one side as it is being entered, it is easy to swing it from side to side or raise it with the derrick until the hemp is driven home and the spigot end properly centered in the bell.

In cases where it is impossible to use a derrick, the pipe may be lowered into the trench by means of a rope at each end with a rolling hitch, one end of each rope being held under the feet of the men lowering, and the other end paid out as evenly as possible so as to lower the pipe without dropping. In this way two men can lower a length of pipe. For sizes too heavy for lowering by hand, a four-legged derrick can be used, or, even better, a large crane or drag line.

Pouring Joints

After the spigot end of the pipe is home and yarned, the joint should be prepared immediately for the joint material, as delay may cause foreign matter to enter. We believe it is best to use a square-running rope with a clamp to tighten it up. We have also found it best to seal this running rope against leakage by the use of fire-clay rather than ordinary clay. Fire-clay may be used over and over again and is not expensive in the long run. After the running rope is sealed, a gate should be built up, depending upon the materials used for joint purposes. Either lead or lead substitutes require heating, and, while formerly the kettles were heated with a wood or coal fire, it is much better to use a kerosene burner, as it will heat the material quickly and, once heated, will hold it in readiness for use, insuring against delays caused by cold material.

The joint material should be handled carefully so as to avoid spilling and possible injury to workmen. The pouring of the joint should be done continuously, and in case one pot will not run the joint, additional pots should be in readiness to carry out the pouring with the least break in time. Immediately after the pouring of the lead, it should be calked to take up the shrinkage caused by cooling. Formerly, most of this work was done by hand, the calker running around the pipe first with a chisel, following up with the calking irons, using the small ones first. If compressed air is available, however, this method should be used in calking. Compressed-air-driven joints are better than hand-driven, as the lead can be taken up from an eighth- to a quarter-inch more than by the hand method without any danger of splitting the bells. Such joints are superior, as the last one driven during the day is as good as the first, whereas the quality of hand-calked joints is liable to lag during the latter part of the day. Furthermore, if the pipe is being laid in large quantities, it is absolutely necessary to calk by air in order to keep up with the laying crew. Sometimes on the larger joints the lead fails to pour evenly, causing a break in the joint, but this may be remedied by calking lead wool into the spot where the break occurs.

At times, unavoidable conditions cause the joints to become wet, and extreme care must be taken in pouring such joints. Before pouring the lead, a quantity of coal oil should be poured into the joint, followed immediately by the lead. In place of the coal oil, lubricating oil or candle shavings may be used with equally good results. It is also a good plan to make a small hole with a knife in the bottom of the joint for drainage purposes. This may allow a little lead to run through, but it will soon freeze at the point of drainage and pour properly. When the pipe is finally placed in the ditch, it should not rest on any solid or unyielding projections, but should lie even so that it will not be subject to any strain, as every strain is a potential trouble-maker.

Pipe Cutting

The writer has seen many cases of poor pipe-cutting caused by awkward methods. A pipe can be cut fairly evenly if the work is done right. Before attempting to make a cut, the pipe should be marked at the exact distance from the end by means of a tape or rule. It is then possible to place a running rope or even cloth tape around the pipe at this point, after which the whole circumference of the pipe may be marked very easily. A cross mark should be made to show the starting and ending points of each turn of the pipe. The pipe should then be placed on a heavy timber with the cutting line directly over the middle of this timber. Starting at the cross mark, a slight cut should be made, using a sledge and hardy. When the cross mark is reached, the pipe should be rolled back to the point of beginning, after which a second and heavier line may be cut with the hardy.

By rolling the pipe back and starting at the cross mark each time, the strain will be kept equal. Finally the pipe will become crystallized to the point where it will snap off fairly evenly without projections exceeding a quarter of an inch. In making cuts on larger pipe, it is a good idea to make the first round with a diamond point, as this removes a considerable amount of the material. Then by following with the hardy, as above mentioned, the pipe will crystallize and crack.

Cutting old pipe in the ditch has been more or less difficult, particularly in the large sizes. When the cut was made with regular cutters, the pipe was generally bound in place even after the cut at both ends was complete, making it necessary to break the pipe, which was oftentimes hard to do in the larger sizes. There is on the market at the present time an oxy-acetylene outfit having a special torch for burning cast iron pipe, and we have found this to be the handiest method of cutting pipe in the ditch, as the cut is at least a quarter of an inch wide and the pipe is free as soon as the cuts are made. To secure the best results with such an outfit, the pipe should be drained, as water in the pipe tends to carry away the heat. It is also best to make the first round with the diamond point, as any chalk marks are burnt off by the hot flame, while the track made by the diamond point can be readily seen.

Location and Setting of Valves

Every distribution line should be properly valved. Most of us have found occasions when we would have given much to have had valves at the proper locations. These valves should be spaced so that a minimum amount of main is thrown out of service whenever it is necessary to work on the line. Not only is this according to the Underwriters' specifications, but it prevents the needless shutting-off of house service. If the Underwriters' rules are followed, the system will always be properly valved. In setting valves, a concrete base should be provided so that there is no chance of the valves' settling. We have found concrete from old sidewalks to be ideal for this purpose. Every valve must necessarily be provided with a valve-box or manhole so that shut-offs may be made quickly. The question of whether to use boxes or manholes is more or less optional in the small sizes, but valves larger than 12 inches should always have the manholes.

Hydrants

Hydrants should be set not farther apart than each street intersection, and in the business district, or in the residence district where the intersecting streets are too far apart, additional hydrants should be set in the middle of the block. At least the business district should be equipped with steamer hydrants, and it is better if the residential districts can also be equipped with them, although the necessity is not so great. In placing hydrants, care should be taken that the hydrant is kept far enough back of the curb to clear all automobile bumpers, and it should be set high enough so that the fire department will experience no difficulty in making the hookup by reason of dirt or snow being too close to the caps. The writer has seen many hydrants set at crazy angles and has made it a point that all hydrants set under his direction were properly plumbed. After plumbing, the hydrant should be braced near the top with temporary wood braces to hold it plumb while the back-filling material is being tamped in place.

The hydrant should have a base of concrete similar to that used for valves, and it is most necessary that the space back of the hydrant to solid ground be filled with concrete to prevent the hydrant from blowing off. No wood should be allowed in these braces, for it will rot and allow the hydrant to push away. At least a bushel of brickbats, preferably of soft brick, should be placed around the base of the hydrant to take care of the drainage water. If this is not provided, the hydrant will not drain, with the probability of freezing. The writer has never set a hydrant without an auxiliary valve in front of it. The expense is not great and is justified because it allows the hydrant to be repaired without interference with service. Hydrant connections should be not less than 6 inches in diameter, and the hydrant should preferably be of the same size.

Tapping

Connecting new lines at right angles to old lines not provided with tees or crosses, naturally necessitates a tap which may be made in two ways—by means of a machine, or by cutting out a section of the pipe and setting in a tee or cross. When made by machine, care should be taken that the split sleeve is centered evenly around the pipe and that there are no defects in the joint. The sleeve should be carefully leveled before the joint is run. After the tee is in place and the joint calked, the machine should be hooked up and the cutting started. The pilot cut is easily made, but the main cut takes considerable labor, and it is of importance that the cutters be sharp and all ground to an even length, otherwise the cutting will be uneven and exceedingly hard to make. When the cut has been made and the piece drawn out, the valve should be closed and the machine removed, after which the laying of the pipe may proceed in the ordinary manner. In cases where it is necessary to insert a tee or cross, a section of the pipe should be taken out, and then the fitting may be set in place and the opening closed by means of a short length of pipe and a sleeve. Where the sleeve is placed, a small section of the pipe is generally missing because it had to be cut short in order to enter the bell. Should a valve be placed close to this point and the pressure applied to one side of the valve only, there is a possibility of the valve's pushing toward this open space and opening up a joint at the valve. The space may be eliminated by cutting a very short section of pipe and dropping it in the opening before the sleeve is set.

Fittings such as tees, elbows and plugs must be properly braced against solid earth in a manner similar to the bracing required for a hydrant. If such bracing is not placed, the chances are that the pressure will open up a joint or crack a pipe near the fitting. Sometimes it is necessary to brace back a considerable distance, and we have found it very convenient to use old pipe between the fitting and solid earth in such cases.

Testing Line in Ground

At the completion of each block of pipe, a test should be applied to prove that no defective pipe or joints are in the line. Formerly, when central station pressure was carried for fire service, it was necessary to make what might be termed a high-service test, but since the advent of the fire department pumper, the policy of putting on additional pressure has practically disappeared, so that we feel safe in using domestic pressure for our tests. If possible, test plugs should be provided so as to make it convenient for removing the air in the line and also for removing the plug when the test is completed. However, if test plugs are not available, an ordinary plug may be used with a lead joint shallower than normal. In cases where oxy-acetylene outfits are available, these joints may be melted very easily.

Backfilling

Backfilling may be done by machine, by hand backfiller and team, or by hand, and the relative cost and speed are in the above order. Naturally, a machine backfiller is preferable, although the use of a hand filler and team does not cost very much more. Hand backfilling is expensive and should not be practiced, if avoidable. We have found it best to pile all the dirt over the ditch, and after it is filled, to flush the ditch. If this flushing is done from above, the results will be poor and incomplete, for the dirt will wedge part-way down in the trench, and the bottom of the ditch will

not be properly settled. The best method of flushing is to place an 8-foot pipe on the end of the hose and push this pipe into the ditch until it hits the water-main; then allow the water to flow until it shows up at the top of the ditch, when the pipe may be moved forward about ten feet. This method is more efficient and better than hand tamping. We have taken a hand-tamped ditch and applied the flushing in this manner and caused the dirt to settle several inches. Practically all the dirt that has been thrown out, except that displaced by the pipe, can be replaced in this manner.

Checking Costs

The cost of laying a water-main should be checked from day to day in order that everybody concerned may be fully conversant with the results. The foreman can practically make or break the job as regards costs. If he is in sympathy with the idea of economy and efficiency and uses his head in planning his work and arranging his men, he can get good results at moderate costs.

With the job complete, a record should be made showing the length, depth, location of specials, hydrants, and valves, and any other data that might be of value in the future. This record should be placed on a map and filed away in a fireproof vault or safe. Card indexes should be made in duplicate showing location of all valves and hydrants, one set being kept in a fireproof place, and the other set kept convenient for instant inspection. Unless this is done, the project cannot be called complete.

ACKNOWLEDGMENT.—From a paper read at the fourteenth annual meeting of the Missouri Valley Section of the American Water Works Association.

Gary Uses Street Flusher as Its Handy Man

Eleven Distinct Tasks Performed by One Motor Tractor and Trailer Unit

A NOVEL machine, capable of performing eleven distinct tasks, has recently been purchased by the Department of Streets, Gary, Ind. This new unit is designed to act as a flusher, auxiliary fire fighter, road oiler, road sprinkler, tree-spraying machine, sewer-inlet cleaner, dewatering pump for basements or stagnant pools, grader, hauling unit for garbage trailers, and heavy-duty commercial truck.

The primary purpose of this motor unit is to keep the city streets clean by flushing in the summer and by removing the snow in the winter. It is equipped with a South Bend flusher for street cleaning. Only a half-hour is required to install the blade snow-plow on the frame provided on the front of the truck. As the blade snow-plow is manually controlled from the cab, it can be used very economically as a road grader and maintainer as well as a snow-removal unit.

The ability of this machine as an auxiliary fire fighter is appreciated. It comes in particularly handy when there is a grass fire or a burning dump or some similar situation to look after, because the tank can carry 3,000 gallons of water beyond the fire limits and acts as a patrol, thus relieving the regular fire department. The unit is not limited to city work, but may go miles into the country and save a house from destruction.

This massive unit can travel 30 miles an hour and, as the truck is of the FWD four-wheel drive type, it can negotiate roads that would be impassable for other vehicles. The suction hose and Municipal Supply Co. filler pump permits the emptying of flooded basements and stagnant pools of water with the minimum expenditure of time and money and takes this burden from the regular fire-fighting equipment, which cannot be spared economically for these odd jobs.

THE ALL-ROUND SERVICE UNIT OWNED BY THE CITY OF GARY, IND., EQUIPPED FOR VARIED MUNICIPAL SERVICE

When a sewer becomes clogged, it is a matter of a very few minutes to open it up and thoroughly clean it in this way. In the summer time the sprinkler attachment makes it possible to keep down the dust on city streets. The unit may also be used for road-oil distribution, and after that work is completed can go back to its regular routine. Resting jacks are provided on the flusher so that the tractor unit may be uncoupled with little delay and the truck used as a tractor truck or with a body as a heavy-duty commercial truck.

City and State Debts May Properly Grow While the National Debt Dwindles

EIGHTY-THREE cents out of every dollar of Federal revenues is used to pay for wars, past and future, but practically one hundred cents out of every dollar of state and local revenues is spent for peaceful and constructive purposes.

That is why the national debt may be expected to dwindle, while the local costs of peace and public welfare may be expected to grow. Ten years have elapsed since the close of our most expensive war. Naturally, the debt for it has been scaled down.

But we must still have school buildings, more of them. New and better roads must be built and devices provided to make motor movement mechanically safe. The large cities must expend larger and larger sums on tubes, tunnels, subways, and surface lines. Everywhere expenditures for sewage disposal and pure water-supply are growing and are now taken for granted. The public health service must continue to expand.

Hospitals and clinics, police protection, fire protection, garbage collection and disposal, curbing, sidewalks, parks, playgrounds, swimming pools, libraries, art museums, auditoriums—all these extensions of the works of peace are increasing faster than growth of population.

In general, municipal and state indebtedness are not unhealthy, notwithstanding the great increases and the fact that some local governments have unwisely contracted debts. In most cities and states, the public is getting needed goods and service more quickly by borrowing than they could by taxation alone. The economic gains from bettered educational facilities, highways, transportation, hospitals, and other public benefits, in the main justify the payment of interest and amortization of the large and growing state and local debts.

—From a copyrighted statement by Irving Fisher, Professor of Economics, Yale University, issued in leaflet form by the Portland Cement Association.

Model Subdivision Regulations

Recommended by a Special Committee of the New York State Conference of Mayors and Other Municipal Officials and the New York State, City and Village Engineers' Association

Preliminary Plans

APPLICATION by the owner or his authorized representative for approval of plans, plats or descriptions showing the layout of highways or streets on private property or of building lots in connection with or in relation to such highways or streets or to existing streets, shall be made in writing to the secretary of the City (Village) Planning Board. Such application shall be accompanied by two copies of a preliminary sketch plan which shall first be approved by such board before submission of a final plan. Such preliminary plan shall be at least 100 feet to the inch scale and shall show:

(a) The location of property lines, buildings, watercourses, railroads and other existing features;

(b) The location and widths of existing and proposed streets, alleys, easements, lots, building lines and similar facts regarding property immediately adjacent;

(c) The title under which the proposed subdivision is to be recorded, with the name of the owner and engineer or surveyor;

(d) The names of all subdivisions immediately adjacent;

(e) The location of any existing sewers and water-mains, culverts and drain pipes on the property to be subdivided;

(f) A contour map, showing contour intervals of not more than ——— feet;

(g) The use of district or districts and the height and area district or districts in which the land to be subdivided falls according to the zoning ordinance;

(h) All parcels of land proposed to be dedicated to the public use and the conditions of such dedication, if any;

(i) Proposed street grades;

(j) A cross-section of the proposed grading for roadways and sidewalks under special or unusual topographical conditions;

(k) Date, north point and scale.

Signed Statement

The subdivider shall coincidently with submitting the preliminary plan also furnish a statement signed by him to the board, reciting:

(a) The nature and extent of the street improvements which he proposes to install;

(b) The nature and extent of any recreational features, parks or playgrounds to be provided, if any, and whether or not, and under what conditions, they are to be dedicated to the city;

(c) That he is able and willing and will proceed forthwith to file a map of record of his subdivision or such part thereof as he may wish to put on the market and will install all monuments in such sections shown on such map of record in such manner and at such time as the board may designate.

Tentative Approval

The tentative approval of the preliminary plans by the board shall not constitute an acceptance of the plan of the subdivision but shall be merely a general approval of the layout submitted. It is to be understood that the ——— shall before final adoption of the plan or plat examine and report as to the grades of the streets, the type of improvements, and the sanitary and drainage conditions and shall have the power to modify any such details submitted by the subdivider wherever advisable for the protection of the city's (village's) interest. The approval of the final plan for record will be considered only when all such questions have been settled to the satisfaction of the proper officials and in accordance with Section 32 of the General City Law (Section 179-k of the Village Law).

When the proposed subdivision is of minor importance and is in a locality where conditions are well known and well defined, the board may relax the above requirements to the extent deemed just and proper.

To Aid City and Village Planning Boards

in the proper control of new real estate subdivisions, the regulations here published have been prepared by the special committee mentioned at the head of this page. Its members are:

Clarence E. Howard
City Planning Consultant, Syracuse
C. Arthur Poole
City Engineer, Rochester
Frank Lanagan
City Engineer, Schenectady

In submitting the report, the committee calls attention to the fact that in New York State the regulations can be adopted by planning boards to which authority has been given by the Common Council or Board of Trustees of the municipality to approve plats under Section 32 of the General City Law or Section 179-k of the General Village Law.

Municipalities outside of New York State desirous of adopting regulations such as these, will of course adapt them to existing laws, or consider the possibility of securing new state legislation for more effective subdivision control. In some states planning laws already permit more drastic platting regulations than the committee believes can be safely adopted under existing legislation in the state of New York.

General Requirements

1. Conform to Official Map.—New subdivisions, in so far as possible, shall conform to the board's established official map.

2. Relation to Adjoining Street System.—The arrangement of streets in a new subdivision shall in general provide for the continuation of the principal existing streets in the adjoining allotment or their proper projection when adjoining property is not subdivided. In general, such streets shall be of a width at least as great as that of existing streets.

3. Block Lengths. — Intersecting streets shall be laid out at such intervals that block lengths between street lines are not more than ——— feet, except where existing conditions justify a variation from this requirement.

4. Block Widths.—The widths of blocks shall be generally not less than ——— feet nor more than ——— feet.

5. Dead-End Streets.—Except where future continuation be possible, dead-end streets shall not be approved unless a turn-around roadway with a minimum radius for the outside curb of ——— feet is provided at the closed end.

6. Grades.—Streets shall be so arranged that grades shall so far as practicable, not exceed ——— per cent for major streets and ——— per cent for minor streets. The minimum grades shall not be less than one-half of one per cent. A variation from these requirements may be made to meet the existing conditions of topography.

7. Reserve Strips.—In general, no subdivision showing reserve strips of land which will prove untaxable for special improvements will be approved.

8. Streets Deflecting Within the Block.—In general, street lines within the block deflecting from each other at any one point more than 10 degrees shall be connected with a curve the radius of which for the inner street line shall be not less than 350 feet. The outer street line shall be parallel to such inner street line.

9. Park and Playground Sites.—In subdividing property, due consideration shall be given to the laying-out of suitable sites for parks and playgrounds.

10. Grading of Streets.—Profiles showing grades approved by the city engineer shall be prepared and submitted to the board with the final plan.

11. Sanitary and Drainage Conditions.—In general, no allotment or subdivision shall be approved unless the same shall be provided with proper sanitary and drainage conditions.

Final Plans

12. After the approval of the preliminary plan, the owner of the property or his authorized representative shall prepare a final or record subdivision plan. The plan shall contain complete data regarding the facts required in the following:

(a) All final plans shall be drawn upon tracing cloth in sheets ——— inches wide by —— inches long and to a scale of ——

feet to an inch, except with the permission of the board; provided that when more than one sheet is required, an index sheet of the same size shall be filed showing the entire subdivision on one sheet with block and lot numbers.

(b) The length of all straight lines, deflection angles, radii, arcs and central angles of all curves shall be given along the proper line of each street. All dimensions along the lines of each lot with the angles of intersection which they make with each other shall also be given. If more convenient, bearings may be used instead of angles. Where a street is not continued straight across an intersecting street into the next block, the connection across such street shall be given by the proper measurement.

(c) All dimensions, angles, bearings and so forth, given on the map, must be referred to at least two permanent monuments not less than 300 feet apart, which shall be indicated on the map. All dimensions shall be shown in feet and decimals of a foot.

(d) The names of all subdivisions immediately adjacent, or if not a subdivision, the names of the property owners, shall be given. Map numbers as recorded in the county clerk's office shall be shown.

(e) All final plans shall bear a title which shall include the name of the subdivision. A north point shall be shown which may be magnetic or true north.

(f) The final plans shall also show the boundaries of the property; the lines of all proposed streets and parks; also lines of all adjoining streets with their names.

(g) The final plans shall be accompanied by a certificate from the engineer or surveyor making such plans to the effect that the plan is correct and made from an actual survey.

13. MONUMENTS.—Monuments shall be placed at such block corners, angle points, points of curve in streets and intermediate points as shall be required by the board. The location of all monuments shall be indicated on the final plan. Monuments shall be of such material, size and length fixed as a standard or as approved by the board.

14. BLUEPRINTS.—Blueprints on cloth of all final or record subdivision plans and index sheet shall be filed as required by the board. These prints shall be upon sheets ——— inches wide by ——— inches long.

15. CERTIFICATE OF ENGINEER.—Before approving the final plan, the board shall request a certificate from the city (village) engineer that all the technical requirements of the plot itself have been checked and found correct and in accordance with the laws and ordinances of the city (village) and these regulations.

Model Amendment for Excess Condemnation to Be Prepared by National Association of Real Estate Boards

THE subject of excess condemnation (or marginal eminent domain) was discussed by Henry G. Zander, retiring President of the National Association of Real Estate Boards, at the joint meeting of the States Council and the Board of State Secretaries and Presidents of that organization, held in Birmingham, Ala., in January.

As a result, the joint body adopted a resolution to the effect that the National Association of Real Estate Boards be asked to prepare a model amendment to authorize excess condemnation, for use in states not already so provided.

The following excerpts are from Mr. Zander's informal address, as quoted in substance in the *National Real Estate Journal:*

"Excess condemnation may be defined as the excessive use of the right of eminent domain. Its first inception is to make it impossible for one man to stand in light of public progress.

"A municipality, of course, must prove that a property will benefit by a public improvement before it can levy an assessment. This should not be difficult to do.

"For instance, we had listed in Chicago a parcel of land for which we were trying in vain to get $30,000. No one would have it at any price. The street was widened, and three years later we sold it for $350,000. And now the present owner has refused $1,250,000.

"Why should this owner expect the taxpayers at large, through a bond issue, to pay for the enhancement in value enjoyed by his property?

"By excess condemnation, the municipality would have condemned, besides the strip necessary for the actual street widening, enough extra to pay for the improvement when it was sold. It would have saved the taxpayers perhaps twenty years of paying on a bond issue.

"This means of paying for public improvements has been used with conspicuous success in London, where an entire street has been rebuilt at a cost of thirty-five million English pounds, or $135,000,000, without one cent of expense to the taxpayer. The street is a beautiful sight, improved with fine buildings constructed according to definite height and architectural restriction laid down by the municipality.

"Architectural restrictions are very much to be desired in ambitious street projects, but they are rather difficult to negotiate. I do not believe that it is possible to restrict for architectural style by ordinance as one does for height, etc. But if authorized by statute, the municipality may, after it has condemned the property and becomes the owner thereby, put in this restriction by covenant and have it run with the land.

"The matter of excess condemnation is one which must be approached and planned with the utmost wisdom, delicacy and equity to insure justice for owner and taxpayers alike. No move should be made until safe expert, practical and legal advice has been retained."

A National Competition for Small House Designs

THE Home Owners Institute, 441 Lexington Avenue, New York City, has just announced what is said to be the most extensive architectural competition for small-house design ever undertaken in the history of American building. Not only is the unprecedented amount of $27,000 being offered in cash prizes for winning designs, but there are two other exceptional features to the competition. First, there will be preliminary regional competitions in twelve districts of the United States, the winning designs from each district to be entered in the national contest. Secondly, the winning designs in each regional competition will actually be built.

Raymond Hood, of New York and Chicago, architect of international reputation, will act as Chairman of the National Committee of Arrangements and also as Chairman of the National Jury of Awards. C. Stanley Taylor, of the firm of Lyon and Taylor, architects and building consultants, and Vice-President and Research Director of the National Building Publications, is acting as consultant in the development of the competition program and the operation of the national and regional contests.

One leading newspaper in each of the twelve geographical districts in which competitions will be held, will be asked to cooperate. There will be a local jury of awards in each area, probably consisting of three or more architects, a contractor, and a real estate expert recommended by the National Association of Real Estate Boards. This jury will select the three prize-winning designs, each design to be awarded a $500 cash prize. This will provide 36 entries for the national competition, in which cash prizes of $5,000, $3,000, and $1,500 will be awarded. Two classes of dwellings will be eligible: Class A, to have six principal rooms, bath and lavatory; Class B to have seven rooms, two baths and lavatory.

Each prize-winning design and possibly some of the honorable mention designs will be built directly following the close of the competition, in the regions where the plans originate. Actual construction cost figures resulting from these tangible developments will be made available throughout the United States.

Competition programs and all information are available from the Home Owners Institute, the name of which has become familiar through this organization's having been responsible during the past few years for the development and supervision of the construction of model homes in sixty communities.

Suggested Standards for Street-Lighting Practice

THE establishment of desirable standards of illumination intensity, post spacing, height of lighting units, etc., to which lighting installations for various types of streets may reasonably be expected to conform, is a problem that has received much attention from street-lighting specialists with various angles of approach. Scientific societies, on the one hand, are endeavoring to evolve fundamental principles, with such specific recommendations with respect to the above categories as may be regarded as settled beyond dispute. As to much of this field there is considerable difference of opinion, and recommendations tend to be tentative and inconclusive, on account of changes in various underlying factors and the difficulty of exact and comprehensive measurement of the effect of specific installations.

Various detailed, correlated recommendations have, however, been made, by men engaged in practical matters of design and installation, whose opinions are of much value. One of the most complete statements of this sort was presented recently by A. F. Dickerson, Chief Engineer at the Illuminating Engineering Laboratory of the General Electric Co. at Schenectady, N. Y., addressing the annual convention of the International Association of Municipal Electricians. He said:

"There seems to be a widespread demand for a set of ready-reference tables for the planning of street lighting in conformity with modern practice. Necessarily, such tables must be general in character, with sufficient latitude in recommendations to take care of the variables such as street widths, traffic densities, foliage conditions, available funds, etc.

"The accompanying recommendations are offered as a summary of hundreds of observations in most of the large cities of this country by the writer combined with the verbal and written comments along the same lines by prominent American street-lighting engineers. It is hoped that their publication will initiate investigation and discussion which will ultimately result in the preparation of even more concrete and explicit recommendations that will tend to standardize American street-lighting practice.

Lighting of Majority of Streets Inadequate for Present Traffic

"It is true that the illumination of a relatively small proportion of the streets of this country equals the values recommended. Yet it is also well known that the great majority of our streets are woefully underlighted for traffic conditions existing today. A few of our progressive cities are installing lighting on all streets in accordance with the values herein suggested, and many more are contemplating such improvement.

"No city is too poor to make an investment such as proper street lighting, which begins immediately to return dividends in the relief of traffic congestion and the saving of millions of dollars in time and in accident reduction. Recent statistics show that 20 per cent of our night traffic fatalities are directly due to insufficient street illumination.

Street-Lighting Expenditures Produce Savings

"When municipalities realize that street-lighting expenditures are investments and not merely additions to the budget, appropriations will be made that will permit the installation of such lighting as recommended in the following tables. No progressive city should be spending less than $2 per capita annually for street lighting, and yet the average today is under $1. There are 50 cities of over 30,000 population that are spending over $1.50 and none of these are entirely adequately lighted. Good lighting will come only through budget increases and it is the duty of the municipal electrician to point out the wisdom and necessity of such increases.

"In the following tables street lighting is classified in terms of 'lumens per linear foot of street.' This is a measure of total light output and, while it does not take into consideration the proportion of the light that reaches the street, it is a convenient and fairly positive measure of the comparative illuminating value of systems when used in connection with properly designed street lighting. This value is easily obtained by dividing the total bare lamp lumens of each standard by the number of linear feet of street per standard, or the total lumens of all the lamps by the linear feet of street lighted.

"In the tables the low figures in general represent minimum values that should be used on narrow streets; whereas, the high figures conform to the best practice for wide streets. Local conditions will dictate the position between the upper and lower limits to be assigned to a given street. When necessity demands that a street be lighted to an intensity below that recommended, provision should be made during installation for future increases in illumination so that it can be brought up to standard without undue expense."

TABLE I

Main Business Streets. Ornamental lighting—wiring underground

	Classification by Population		
	Over 100,000	30,000 to 100,000	Below 30,000
Lumens of lamps	15,000–45,000	10,000–25,000	6,000–15,000
Lamps per standard	2	1 or 2	1 or 2
Arrangement of standards	Opposite on wide streets—staggered on narrow		
Feet of street per standard	50 to 75	40 to 75	40 to 75
Lumens per linear foot	600 to 2000	300 to 800	120 to 400
Height of upright unit	20 to 30 ft.	18 to 25 ft.	15 to 20 ft.
Height of pendent unit	25 to 30 ft.	20 to 30 ft.	20 to 25 ft.

TABLE II

Secondary Business Streets. Ornamental lighting—wiring underground

	Classification by Population		
	Over 100,000	30,000 to 100,000	Below 30,000
Lumens of lamps	15,000–25,000	10,000–15,000	6,000–10,000
Lamps per standard	1	1	1
Arrangement of standards	Opposite on wide streets—staggered on narrow		
Feet of street per standard	50 to 75	40 to 75	40 to 75
Lumens per linear foot	300 to 500	150 to 300	60 to 150
Height of upright unit	15 to 18 ft.	15 to 18 ft.	15 to 18 ft.
Height of pendent unit	20 to 25 ft.	20 to 25 ft.	20 to 25 ft

TABLE III

Traffic Arteries. Ornamental or semi-ornamental—wiring underground and overhead

	Classification by Population		
	Over 100,000	30,000 to 100,000	Below 30,000
Lumens of lamps	6,000–10,000–15,000	6,000–10,000	6,000
Lamps per standard	1 or 2	1	1
Arrangement of standards	Staggered except on very wide streets		
Feet of street per standard	75–150	100–150	100–150
Lumens per linear foot	60–200	40–100	40–60
Height of upright unit	15–18 ft.	15–18 ft.	15–18 ft.
Height of pendent unit	20–25 ft.	20–25 ft.	20–25 ft.

Secondary arteries will usually take the lowest rating.

TABLE IV

Residential Streets—Not Thoroughfares. Ornamental and semi-ornamental—underground and overhead wiring

	Classification by Population		
	Over 100,000	30,000 to 100,000	Below 30,000
Lumens of lamps	2,500–6,000	2,500–6,000	2,500–6,000
Arrangement of standards	Staggered	Staggered	Staggered
Feet of street per standard	60 to 150	75 to 200	100 to 200
Lumens per linear foot	20 to 40	15 to 30	10 to 20
Height of upright unit	13 to 18 ft.	13 to 18 ft.	13 to 18 ft.
Height of pendent unit	18 to 25 ft.	18 to 25 ft.	18 to 25 ft.

Outlying districts and partially developed sections with little traffic are usually best lighted by fairly large size pendent units at long spacings (300 to 500 ft.), or more numerous small units when there is tree interference. Units are usually installed as the demand arises, so that it is hardly worth while attempting to make the installation conform to a given standard.

TABLE V

Industrial and Warehouse Sections not on Traffic Arteries. Pendent lamps—usually overhead wiring

	Classification by Population		
	Over 100,000	30,000–100,000	Below 30,000
Lumens of lamps	6,000–15,000	6,000–15,000	2,500–10,000
Arrangement of lamps	Staggered	Staggered	Staggered
Feet of street per standard	200 to 500	200 to 500	200 to 500
Lumens per linear foot of street	20 to 50	15 to 50	10 to 30
Height of pendent unit	20 to 50 ft.	20 to 25 ft.	18 to 25 ft.

TABLE VI

Highways outside of city limits. Pendent lamps—overhead wiring

	Wide and Heavy Traffic	Narrow and Heavy Traffic	Narrow and Light Traffic
Lumens of lamps	2,500–10,000	2,500–6,000	2,500
Arrangement of lamps	Staggered	Staggered (preferred)	One Side
Feet of street per lamp	150 to 200	200 to 300	250 to 300
Lumens per linear foot	15 to 50	10 to 30	8 to 10
Height of pendent unit	25 to 35 ft.	20 to 30 ft.	20 to 30 ft.

When units especially designed for confining light to the road surface are used, small lamps will suffice. Where illumination is also necessary on sidewalks and cross-streets with the majority on the pavement, the larger lamps are necessary.

Another table in different and more compact form is that of L. A. S. Wood, Manager of the Street-Lighting Section

Nothing Equals the Motorcycle Policeman for—

Pursuing Law Breakers

EVERY well regulated community needs motorcycle police—to stop reckless driving, to protect pedestrians and children, and to run down escaping criminals.

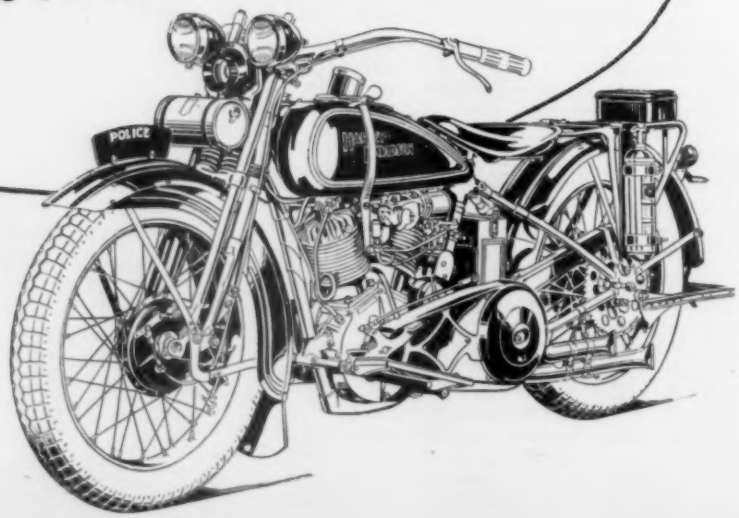
The very presence of a motorcycle man—a glimpse of his uniform and his Harley-Davidson—has a checking effect on law violators. In this he has a great advantage over the policeman on foot or in an automobile.

Experience of more than 2900 departments shows that the Harley-Davidson is the police motorcycle par excellence. Its speed, ruggedness, and low cost of operation make it the ideal mount for police service.

Write for our Special Police Booklet—it gives the facts in full.

HARLEY-DAVIDSON MOTOR CO., *Dept. M, Milwaukee, Wis.*

HARLEY-DAVIDSON
The Police Motorcycle



of the Westinghouse Electric and Manufacturing Co. at South Bend, Ind., which he has presented in connection with a paper before the last annual convention of the American Society for Municipal Improvements. It is given herewith:

Class of Street	Mounting Height	Spacing	Lumens Per Standard	Average Horizontal Illumination, Foot-Candles	Uniformity Factor
1—Main business	18 to 25	100 to 140 (Opp.)	20,000 to 75,000	1.3 to 3.0	.75
2—Minor business	15 to 18	100 to 150 (Opp.)	10,000 to 30,000	.8 to 1.5	.75
3—Main traffic arteries	15 to 17	120 to 160 (Opp.)	6,000 to 20,000	.5 to 1.0	.70
4—Minor traffic arteries	14 to 16	100 to 140 (Stag.)	4,000 to 10,000	.2 to .3	.60
5—Residence districts	12 to 15	110 to 150 (Stag.)	2,500 to 6,000	.1 to .2	.40
6—Park drives	12 to 15	125 to 200 (Stag.)	2,500 to 4,000	.1 to .15	.35
7—Minor residence districts	18 to 25	150 to 200 (Stag.)	2,500 to 4,000	.1 to .12	.25
8—Warehouse districts	18 to 25	150 to 250 (Stag.)	2,500 to 4,000	.08 to .12	.25
9—Alleys	18 to 25	180 to 250 (Stag.)	2,500 to 4,000	.08 to .12	.40
10 Highways	25 to 35	250 to 350 (O. S.)	2,500	.05 to .10	.50

Opp.=Opposite spacing. Stag.=Staggered spacing. O. S.=One side of roadway.
Uniformity factor=ratio of minimum foot-candles to maximum foot-candles.
NOTE: The first six classes of streets should be lighted with ornamental equipment; classes seven to ten with utilitarian.

Still another form of analysis of specific installations is the appraisal form devised by the Illuminating Engineering Society Committee of Street Lighting, of which both Mr. Dickerson and Mr. Wood are members, for the purpose of comparing the relative general effectiveness of various installations. This was given in THE AMERICAN CITY for January, 1928, on page 128.

The Illuminating Engineering Society committee has also worked out a statement of the fundamental elements of good street lighting, presented as its "Principles of Street Lighting" to the 1927 convention of the Illuminating Engineering Society, and included in the 1928 Municipal Index at pp. 289-291. This statement was supplemented at the last convention by a discussion of various engineering considerations, which will appear in the 1929 Municipal Index. In connection with the committee's work, detailed data of a number of American installations have been gathered and set forth in tabular form, accompanying the convention report.

As an approach to another phase of this problem, dealing with numerical expressions, but from the standpoint of controlling the execution of any given project, may be mentioned the British Street Lighting Specification briefly discussed in THE AMERICAN CITY for January, 1929, on page 171.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Recent Zoning Ordinances

DENVER, COLO.—Amendment of the following sections of Zoning Ordinance of February 11, 1925:

Section 10. Private garages in residence districts.
Section 13. Lot area.
Section 12. Paragraph C. Height regulations.
Section 15. Paragraph B. Percentage of Lot Occupancy.
Section 17. Paragraph B (1) and B (2). Rear yards and loading space.
Section 19. Paragraphs 2, 3, and B. Front yards in residence districts.
Section 20. Paragraphs A and F. Front yards in business and commercial districts.

A copy of the Zoning Ordinance of 1925, containing these amendments, revised to January 1, 1929, has been issued.

WARWICK, N. Y.—Ordinance April 27, 1928.

Undertaking Establishments

ARIZONA.—*City of Tucson v. Arizona Mortuary,* 272 Pac. 923.—A municipality may pass any reasonable ordinance compelling proprietors of undertaking and embalming establishments to conduct them in as sanitary and unoffensive a manner as possible without defeating the necessary purpose of their maintenance.

Zoning ordinances will not be declared unconstitutional unless it affirmatively appears that they are unreasonable and without any substantial relation to public health, safety, morals or general welfare.

A corporation purchasing land outside the strictly business sections of the city and letting a contract for building a mortuary thereon before the adoption of the zoning ordinance prohibiting the maintenance of such business in that location, but fully advised before any material amount of construction was actually done that the ordinance was contemplated, has no vested rights entitling it to set up any loss arising from proceeding with the construction thereafter.

Financial loss, however severe, does not of itself give parties a vested right to continue a business, no matter how long it has been conducted, if it is one whose location may be regulated by the city under the police power.

Single-Family House Restrictions and Fraternity Houses

MICHIGAN.—*Seeley v. Phi Sigma Delta House Corporation,* 222 N. W. 180.—In private building restrictions, the term "private dwelling-house" means a building designed as a single dwelling to be used by one family.

Such a covenant does not prohibit a college fraternity or chapter house, intended to provide board and room for part of the members and a gathering-place for fraternity purposes for all members.

Projecting Signs

MINNESOTA.—*State v. Wong Hing,* 222 N.W. 639.—Section 252 (e) of the ordinance of the city of Minneapolis, regulating the construction and maintenance of signs projecting over sidewalks and public ways is valid as a proper exercise of the police power.

What Constitute Practical Difficulties

NEW YORK.—4672 *Broadway Corp. v. Board of Standards and Appeals of City of New York,* 232 N. Y. Supp. 266.—On application for variation in the building zone regulations for the construction of a garage on the ground of practical difficulties and unnecessary hardship, proof of inconvenience and expense to the applicant in making a particular improvement, and that the garage would be economically advantageous to the owner by reason of the improvement, are not proper criteria to authorize a variation, which must be based on considerations of public health, safety and general welfare. The Stillman Case, 222 App. Div. 19, 225 N. Y. S. 402, followed.

Business District—Limit of Number of Employees Invalid

NEW YORK.—*People ex rel Bartnett v. B. B. F. Holding Corp.,* City Court, Westchester County, reported in the *Standard Star* of New Rochelle, January 22, 1929.—The defendant had erected a laundry employing some forty persons in a business district in which the erection or use of a building for that purpose was permitted if employing not more than five persons. *Held* that the building might be used employing forty persons, the Court being unable to say that such employment is a detriment to the public health, safety or general welfare, as set forth in the zoning enabling act (Sec. 20, Subd. 25, of the General City Law).

Vested Right in Permit

NEW YORK.—*Rice v. Van Vranken,* Supreme Court, 132 Misc. 82, 229 N. Y. Supp. 32; Appellate Division, January term, 1929.—Injunction to restrain the

"L-Twin" Motor Lawn Mower and Roller. Mows and rolls simultaneously 6 to 8 acres a day. With gang units attached, machine cuts 10 acres a day on one gallon of gasoline.

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We challenge the world on the Coldwell "L-Twin" Motor Lawn Mower and Roller. No other machine provides more economical operation, greater dependability, and advanced engineering features. Then, too, "L-Twin" is in a class by itself in developing maximum power continuously in hottest weather without overheating.

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***DEPENDABLE* LAWN MOWERS**

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erection of an apartment house in a zone restricted against such use. Defendant had obtained a permit for the house, and had spent money for travelling expenses and tentative plans, before the passage of the ordinance. *Held* that the permit was revoked, no vested right having been created by the expenditure in question.

Plaintiff was the owner of property near that of the defendant, in the same district. *Held* that he was a proper plaintiff.

Zoning and Planning Reports

The annual report of the National Capitol Park and Planning Commission for the fiscal year ended June 30, 1928, has appeared. It sets forth the zoning and planning activities of the Commission during that period, including cooperation with Maryland and Virginia in the effort of the District of Columbia and the two states to obtain a development of the region in and around the Capitol in which the nation may take pleasure and of which it may be proud.

The Regional Planning Commission of the County of Los Angeles, California, has issued its annual report, dated January, 1929. The Commission also circulates in typewritten form from time to time notes of interest to planners throughout the country.

Of unusual interest is the pamphlet entitled "City Plan of the City of White Plains, New York." It was prepared by E. P. Goodrich and Robert Whitten, city planning consultants, in cooperation with the Commissioners of Public Works, the Commissioner of Finance, the City Plan Engineer, and the City Plan Committee of the city, and on September 4, 1928, was adopted by the Common Council. It includes not only planning and zoning studies usual in such reports but regional planning and a capital budget.

The plan is intended to cover, physically and financially, a period of fifty years. It is official in that it was prepared on the order of the City Council and has been approved by it by a vote "adopting" it, but does not legally bind the city in its future improvements. The pamphlet, with its diagrams, maps, and statistical tables, in addition to the written presentation of the situation and the solution of the problems involved, is a real contribution to city planning literature.

The weekly "Bulletin of the Board of Standards and Appeals" of the city of New York, dated January 15, 1929, contains the annual report of the Board.

Esthetics in St. Charles, Ill.

The city of St. Charles, Ill., has issued a book in which is included the zoning ordinance, the building code ordinance and the subdivision control ordinance. Of interest, especially at this time when so much attention is being given to esthetic control in various parts of this country, is the provision, in Section 4 of the building code, for the appointment of an architectural committee "created to pass upon the architectural design and arrangement of all buildings to be hereafter erected or altered." The duties of the Committee are stated in Chapter XXIV, Section 96 of the Code, which reads as follows:

"Section 96: Every building hereafter erected or altered in the city of St. Charles shall be so designed and arranged as to be suitable in its neighborhood, and the architectural committee provided in Section 4 shall be the judge of this matter in passing upon plans submitted with applications for permit. It is not contemplated that material additional cost may be required to conform to this regulation, but that the design, arrangement, and placement of the building shall be the best possible without adding materially to the cost thereof."

Esthetics in New York State

The Fine Arts Federation of New York has issued a pamhplet stating the reasons for the re-establishment of the State Art Commission, abolished under the administration of Governor Smith. The booklet is an admirable summary of the arguments in favor of commissions of this sort, national, state, and municipal, the value of which is greatly increased by the excellent illustrations it contains.

It appears that of all the art commissions created in this country, that of the state of New York is the only one that has ever been abolished.

Results of Zoning in New Jersey

In order to ascertain the effect of zoning in that state, the Bureau of Municipal Information of the New Jersey State League of Municipalities, located at Trenton, has issued a questionnaire, widely circulated, covering the various phases of the subject. The answers to this questionnaire are given in its mimeograph report No. 223 and on the whole seem to be decidedly favorable.

Street Traffic

A committee of the American Electric Railway Association, 292 Madison Avenue, New York, has for the past two years been making a careful study of street traffic conditions and economics. The committee has now issued a report, giving the results of a large number of studies of great value. The committee is continuing its study.

Mathematical Relation of Building Height and Street Traffic

In these notes in a previous issue of this magazine attention was called to an interesting article in the *National Municipal Review*, giving a solution of the problem of tall buildings in relation to street traffic in mathematical form. In the February number of that magazine, Ernest P. Goodrich takes exception to these calculations, giving his reasons, by means of additional equations.

City Utility Questions in Various States

Important Public Utility Matters Are Receiving the Attention of Many Legislatures. A Few Outstanding Situations Are Here Described

Wisconsin Cities Present Case for Municipal Ownership

AN active interest in public-utility matters among the cities of Wisconsin is now expressing itself through two organizations, one of them the newly formed Wisconsin Municipal Utility Association and the other the League of Wisconsin Municipalities, which for a number of years has dealt with various municipal problems. The new association was organized on October 31, 1928, at Menasha, Wis., at a meeting where delegates from ten cities were in attendance. The purposes of the association as listed in the constitution are:

1. To secure and disseminate information in regard to municipal ownership of utilities which shall be intended to increase the progress and efficiency of municipal utilities
2. To aid and assist its members in securing engineering and legal advice in matters pertaining to or affecting utilities
3. To promote such legislation as will be beneficial to the municipal utilities of the state and to prevent such legislation as may be injurious thereto
4. To hold meetings and conventions of the members.

Funds for the work of the association are to be raised by requiring each municipality which becomes a member to pay an annual membership fee of 1/5 of one per cent of the gross operating revenue of its municipal utilities. The following officers were elected: President, C. E. Raught, Kaukauna; Vice-President, C. P. Gross, Wisconsin Rapids; Secretary-Treasurer, John Jedwabny, Menasha.

The immediate activity occupying attention of this association was to assist in presenting the case for municipally owned utilities at a hearing on November 9 before the interim committee of the State Legislature, appointed to study the hydro-electric resources of the state, the relative cost and efficiency of public and private plants and the problem of regulation. The association was represented at this hearing by its legislative committee: City Attorney G. L. Mooney of Plymouth, Superintendent J. H. Kuester of Menasha and Superintendent J. O. Posson of Kaukauna.

Briefs were also submitted to this committee by the League of Wisconsin Municipalities, and personal presentations on behalf of the League's public power program were made by Village President Theodore Kronshage of Fox Point and

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Definitely Solving Your Outgrown Sewage Disposal Problem

HERE'S the solution that has the advantage of flexibleness. Solves it without the addition of a bit of extra land. Solves it by simply making some of the land you have, do from 3 to 4 times what it does now.

It can be done by covering some of your sludge beds with our Glass-Overs.

Being attractive, they increase instead of lower nearby property values.

They, to a large degree, practically overcome the odor objection.

It happens that we were among the first to build sludge bed glass-overs.

Right now we can refer you to around thirty-five installations so equipped.

One of them unbelievable as it may seem at first thought, is located in a park right in a civic centre.

Glad to tell you about it and send photograph.

You are, of course, welcome to our printed matter. Our specialists are at your disposal without obligation of any kind.

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Irvington, New York
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Philadelphia, Land Title Bldg.
Chicago, Cont. Bank Bldg.
Boston, Little Bldg.
Cleveland, 1304 Ulmer Bldg.
Denver, 1247 So. Emerson St.
Kansas City, Commerce Bldg.
St. Louis, 6100 Prescott Ave.
Montreal, 1410 Stanley St.
Greensboro, N. C., Greensboro Bank Bldg.
Buffalo, Jackson Bldg.
Albany, 1204 State Bank Bldg.
Toronto, Harbor Comm. Bldg.
St. Catharine, Ontario, Can.

Mayor D. W. Hoan of Milwaukee. This program, which was adopted unanimously at the last annual convention of the League, is as follows:

1. That cities and villages owning and operating electric light and power plants, or contemplating the purchase of plants, be assisted by the railroad commission, either as a service or at cost, to apply improved methods so that the plants can be operated at the highest possible degree of efficiency and economy
2. That cities and villages be given the power to extend their electric light and power systems beyond the corporate limits, and to interconnect and cooperate with other municipal plants
3. That cities and villages be authorized to build and operate electric plants in competition with existing plants
4. That the formation of power districts, in which the municipalities and intervening rural districts may cooperate in the construction and operation of electric systems, be authorized, and
5. That the state constitution be amended to enable the state to recapture existing power sites at the expiration of present franchises, and to permit the state to cooperate with municipalities in the production and distribution of electric power.

Nebraska League Guards Municipal Utility Interests

ANOTHER state where municipal utilities are the subject of much discussion is Nebraska, where the League of Municipalities is sponsoring a program of legislation for the present Legislature that includes measures to surround the attempted sale of municipally owned utilities with safeguards against hasty action. The present statutes applicable to cities of the second class and to villages are said to permit private companies to acquire municipally owned properties with comparative ease, a majority vote of the council, on a power company's offer, for example, being sufficient; while to construct a municipal utility plant in the first instance requires a vote of the people. The League believes that the people should be the final arbiters in each case, and recommends that sale or lease of a municipal plant shall be made only after receiving a 60 per cent vote at a special election called upon a petition signed by 30 per cent of the number of voters at the last general election, and after an engineering appraisal.

The League also favors legislation to do away with injunction suits brought at the instance of power companies (in the name of taxpayers) to hamper the extension of a municipal plant out of earnings. It would specifically authorize the pledging of accumulated and future net earnings of municipal plants for such purposes.

Statutory power is also sought to enable all municipal plants to sell electricity or other utility products to rural users and to other municipalities nearby, through a law having the following features relating to such plants:

Authorized to sell to any person, firm or corporation within limits of town and outside of town within a radius of 25 miles.

Contract of sale outside such corporate limits to be mutual and binding upon the town selling the same and not a unilateral contract as the law provides at present, where a town is only permitted to sell its surplus.

Cost of such extensions to serve customers outside town limits may be paid out of accumulated earnings or future earnings; or by bonds or taxes if authorized by majority vote of people.

Purchasing town still may vote transmission-line bonds or taxes to build to the corporate limits of the selling town as now provided but may also pledge accumulated or future earnings to pay for such transmission lines to connect their distribution system to master meter at corporate limits of selling town.

Advertisement for bids and open bidding required when extensions to transmission lines are to be paid for out of earnings.

Utility Regulation Under Fire in New York State

THE first public-utility commission to be established by any state, the Public Service Commission of New York, is, together with the system or regulation that it typifies, under criticism from various sources, and an official investigation has been recommended by the *New York World*, the City Club of New York, and the unofficial Public Committee on Power. The City Club addressed a notable memorandum on "The Regulation of Electrical Utilities in New York*" to Governor Franklin D. Roosevelt, the letter of transmittal accompanying the 43-page booklet including the following:

"Public utility regulation in the State, as the memorandum shows, has reached a low ebb. It fails to obtain reasonable rates. It fails to prevent this field from being the scene of speculative stock jobbing. The companies have learned how to get around the existing time-honored devices of regulation, and, through adroit financing and holding-company schemes, achieve speculative exploitation of consumers. . . .

"Our memorandum deals principally with electric rates and conditions in the electric power industry, because this industry is undergoing the most rapid changes, physical and corporate, and these changes contain the greatest potentialities for benefit or harm to the general public. We know that you have heretofore recognized the importance of state control of undeveloped power sources, and that you have spoken strongly on that subject. You of course realize that cheap power at the source, and state control of future hydro-electric development can give very little benefit to the ultimate consumer without strict regulation and control of the existing companies that cover the state with their franchises to distribute electricity to domestic consumers. It would be quite possible for the state to carry through a large and highly successful hydro-electric development, without its being able to insure cheap power to a single domestic user. Reform of utility regulation must therefore be accomplished or the state's program will fail. . . .

"We point out first in our memorandum that electric rates for domestic service in New York State are far higher than they should be. They are 20 per cent higher than the average for the rest of the United States. Even assuming that rates everywhere else are as low as they should be, this is a difference in the wrong direction, for with the cheapest hydro-electric power in the world up-state, and with the enormous concentration of power demands and diversity of loads in New York City, there would be every reason to expect exceptionally low rates in both parts of the state. Moreover, they are four times as high, on the average, as domestic rates in Ontario, where this concentration is lacking.

"In the second place there is in evidence a feverish activity of financial interests to issue more and more securities against the existing property of the operating companies. This itself is a sufficient symptom of excessive present or expected earnings. The danger is that the increased fixed charges and dividend requirements thus created will make it difficult if not impossible ever to secure the low rates that would be possible with prudent financing. Under the present system the operating companies are not permitted to recapitalize, but overcapitalization of holding companies has, indirectly, much of the same effect, and the indications are that the overcapitalized holding companies will follow the example of the Buffalo, Niagara & Eastern Power Corporation and petition the Commission for permission to become operating companies. It threatens more than present high rates; some day when the rapid growth of the industry is checked, the prosperity will be diminished, the companies will find themselves saddled with ruinous fixed charges, with rapidly depreciating plant property, and the public will undergo the same experience of poor or indifferent service at high rates that has been its share with electric railways, which went through exactly the same processes in their golden days. . . .

"Another matter that deserves scrutiny is the use of rate-payers' money to disseminate propaganda designed to prevent criticism of existing conditions in the utility field, to suppress public ownership sentiment, and to purchase good will of newspapers. While we believe that considerable expenditures for publicity may legitimately and wisely be made by utility companies, everyone knows they have gone far beyond that limit. The Federal investigation has revealed the general fact, but has not touched the large interests that are confined to New York State."

* Listed on page 179.

Move to Restrict Texas Cities' Utility Powers Opposed

TEXAS is one of the few states where there is no state commission having fairly complete jurisdiction over public utilities. There is a state Railroad Commission, but other than as to railroads its regulating power applies only to gas companies, and that to a limited extent. An effort is being made to extend its jurisdiction over the other public utilities, and this has included an attempt to include municipally owned utility enterprises. These proposals brought out active protests from the cities, and upon the introduction in the Legislature of a bill embodying them, a meeting of the executive committee of the Municipal Utilities League, of Texas, was called, and the following resolution was passed unanimously after discussion of the situation by representatives from nine cities:

Resolved, The sense of this meeting is that Senate Bill 129 is objectionable to the municipalities owning, or desiring to own and operate their

New Highways for Old—*Quick!*

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THE discomforts, inconvenience and losses caused by worn-out roads are always expensive and wasteful, compared with what it costs to transform these old roads into smooth, pleasant-riding, non-skid highways with Tarvia "Re-Tread."

As public acquaintance with Tarvia "Re-Tread" grows, it is bound to occupy an important place in the planning and thinking of every highway official. Acquaint yourself—and your community—with this material and method. Here is a means of highway rejuvenation that is simplicity itself. Costs are impressively low—and there need be no interruption to traffic.

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Why not remember to mention THE AMERICAN CITY?

own public utilities, for several reasons:

First—That it takes from the city commissions the power to fix rates on utilities owned by their cities.

Second—That it prevents any city putting in any public utility or extending any existing utility into territory already served without first securing from the Railroad Commission a certificate of public convenience and necessity.

Third—It effectively takes from the municipalities the right to give franchises for a term of years, as it grants an indeterminable permit.

Fourth—That it places on the Railroad Commissioners multitudinous duties in addition to their present duties, while their present duties are beyond the capacity of any commission to properly care for.

For the above reasons and other uncertain provisions of the bill, we feel that the entire measure is most objectionable.

(Signed) O. E. Carr, City Manager, Fort Worth; J. D. Hockersmith, Mayor, Vernon; J. Bryan Miller, City Manager, Bryan, committee.

Last reports indicate that the indeterminate permit, and control over municipally owned utilities, will not be included; but the deprivation of home rule over other utilities, the possibility that the entry of cities into new utility undertakings would be hampered, the overloading of the Commission, particularly in view of the unsatisfactory results of commission regulation elsewhere, and the fear that the great financial interests involved in statewide regulation would influence election to the Commission in the future, are considered to be objections to the bill nevertheless.

Burlingame Traffic Controls Itself by Blowing Its Horns

TRAFFIC at the intersection of Broadway and the Highway in the city of Burlingame, Calif., now acts as its own director, operating the "Stop" and "Go" lights to meet the requirements of the moment. It is the first city to have installed the new type of traffic-operated signal. The following description of this interesting installation is presented through the courtesy of J. G. Regan, Street Lighting Department, General Electric Co.

Burlingame is a suburban residence community 17 miles southwest of San Francisco. Situated as it is on two main highways of the state network, it presents a difficult traffic problem, especially on holidays and over week-ends. A recent survey showed 27,862 automobiles passing through Burlingame on the main highway in a 12-hour period, and the period was not on a heavy Sunday.

The traffic situation at the corner is such that a standard automatic-type timer is not applicable, as a result of the heavy highway traffic, and variable traffic on Broadway crossing the highway. The problem has been solved by the installation of a G-E Novalux traffic-operated controller in conjunction with a standard three-color signal. The control is actuated by the sound of a horn, and hence responds to varying demands of travel on the secondary thoroughfare. It solves the problem of the side streets in that the highway or main street traffic is not held up or stopped unless there is traffic on the side street.

Vehicular traffic approaching the highway from the side street is faced by a red light, and stops near a sound-collecting box located at the right curb. The automobilist sounds his horn near the sound-collecting box, and an amber light appears, signifying that his horn signal has registered. The green light soon appears—with red on the main highway—and the automobilist proceeds into the intersection.

After a predetermined interval the lights change back from red to green on the main highway, and from green to red on the side street. The timing cycle operated by the sound-controlled device is completed shortly thereafter, main traffic retaining the uninterrupted right-of-way until the next cross-bound vehicle appears.

In case a motorist traveling in the cross-street reaches the intersection just after the lights have changed back to favor main traffic, he cannot immediately get the right-of-way, even though he blows his horn at the sound-collector. He sees the amber light, indicating his signal registered, but the red light against him continues until the timing cycle is completed, whereupon he receives a green light and main traffic a red light. This arrangement prevents cross-traffic from indefinitely holding up main traffic. Even if cross-traffic should be heavy at times, so that cars are continually signaling at the sound-collector, main traffic is still assured the right-of-way at stated intervals, and recaptures the continuous right-of-way as soon as the rush of cross-traffic ceases.

The traffic-operated controller, as its name implies, is sensitive to passing traffic, but, unlike the standard control, it is operated by traffic. With this arrangement, traffic is never stopped on the main street unless pedestrians or vehicles are moving out of the side street. Furthermore, side-street and main-street traffic can never be held up longer than a minimum short period of time.

The apparatus installed at Burlingame includes four Novalux post-top signals on Union Metal traffic signal standards, placed on the far right-hand corners of the intersection. On Broadway, at the near right-hand corner of the intersection, is mounted a sound-collecting box, consisting of an 18-inch megaphone and telephone transmitter in a sturdy metal housing. This box is connected to the control apparatus, which is mounted on a convenient power pole, from which the 110-volt alternating current is obtained. The traffic-operated control also provides for pedestrian control by means of a button located at the side of the crosswalk, the button performing the same service for pedestrians as does the sound-collector for the automobilist.

INTERSECTION IN BURLINGAME, CALIF., CONTROLLED BY HORN-OPERATED SIGNAL, AND CLOSE VIEW OF THE SOUND-COLLECTOR

$373,162,000—that was the value of one year's construction work let to contractors outside the states in which the work was being done. The number of these contracts totaled more than 800. Every kind of work was included—water-works, sewers, bridges, streets and roads, buildings, dams.

The reason for the large volume of work let to outside contractors is easy to find:—Distant contractors often turn in bids lower than those of local contractors. They are frequently better equipped for the work. Executives in charge of public work are finding out that they can save money by giving outside contractors a chance to bid on equal terms with local contractors.

They are calling for bids *nationally* and are letting their contracts regardless of the location of the bidders.

Advertise *your* next contract *nationally* in *Engineering News-Record* Discover for yourself the advantages of the widest possible competition on contracts. Learn at first hand why *Engineering News-Record* is the dominant proposal advertising medium and why the volume of its proposal advertising is increasing steadily.

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Centralized Milk Supervision for Five Municipalities Proves Its Value

By WILLIAM B. PALMER

EXECUTIVE OFFICER, MILK INSPECTION ASSOCIATION OF THE ORANGES

FOR fifteen years there has been conducted in the Oranges, N. J., a successful official cooperative organization for the supervision of the milk supply of five separate but adjoining communities. This was the first arrangement of the kind in the United States, and its success has demonstrated the practicability of such a cooperative plan.

Organization

The Women's Club of the Oranges in 1914 called a meeting of the officials of Orange, East Orange, West Orange, South Orange and South Orange Township (now Maplewood) at which a report based on a year's study of the milk supplies of the several communities, made by the Executive Secretary of the Civic Committee of the Club, was presented. The disadvantages of individual supervision were shown and the desirability of a cooperative central supervising system was demonstrated. The result was the organization of the Joint Milk Committee of the Oranges. Two members and the Health Officer of each Board of Health were appointed on this Committee. A budget assessed to each of the municipalities on a per capita basis provided funds for the Committee. The use of the laboratory and office of the Orange Health Department was given to the Committee, an arrangement which has been continued to the present time. An Executive Officer was employed to act as inspector and analyst, and the control work was begun in 1915 after adoption of a uniform milk ordinance by each Board of Health. Later an office and laboratory assistant was employed. In 1917 the Committee reorganized as the Milk Inspection Association of the Oranges, adopting a constitution and by-laws approved by the Boards of Health. Monthly and quarterly reports are issued and a biannual report published.

Uniform Ordinance

The original uniform ordinance provided for the following grades of milk and cream: certified, grade A and grade B raw produced by tuberculin-tested cows, and grade A and grade B pasteurized. In 1917 grade B raw was abolished, and in 1918-1920 East Orange, West Orange and Maplewood further amended the ordinance to permit certified and pasteurized products only. The other two communities have not as yet adopted this procedure.

Appropriations

Although considerable progress has been made, high standards attained and the population greatly increased, the cost of milk supervision has continued to remain at about 4 cents per capita, and the Association's budgets have averaged about 7½ per cent of the total public health appropriations. Membership fees paid by each municipality total about one-half of the budget, and the balance is assessed against the municipalities on a per capita basis.

No Milk-Borne Epidemic in Nine Years

Prior to 1920 several milk-borne epidemics occurred in the Oranges and in all instances raw milk was the medium of transmission. For the past eight years there have been no outbreaks. During this period from 91 to 96 per cent of the supply has been "certified" or pasteurized and more stringent supervision has been exercised officially and by the dealers.

Administration

During the fifteen years the Association has been in existence important changes have taken place in the supervision and standards of supplies, milk plants and equipment, consumption of milk and control, and elimination of milk-borne epidemics.

Cooperation has been the principle on which the Association has endeavored to conduct its activities. By adopting this course much has been accomplished, and educational work with producers and dealers has been possible. Those dealers who failed to respond to the efforts of the Association and failed to meet legal requirements were eliminated by revocation of licenses. Thus the situation became a true example of the principle, "the survival of the fittest," and the dealers who have remained in business respect the Association's attitude and endeavor to exceed the legal standards and requirements.

Service has been rendered to the dealers in the establishing of laboratories for bacterial and chemical control and in the development of dairy and creamery inspection work. To facilitate this work, appeal was made to the State Agricultural College at New Brunswick in 1925, and a special course on milk analyses was instituted in connection with the short courses on dairying and allied subjects. Through this arrangement valuable aid is rendered by the College to milk companies and health departments.

Dealers have been furnished with plans and specifications for new creameries, pasteurizing and bottling plants, equipment installation, and alterations to old establishments. Advice and assistance has also been rendered to machinery manufacturers in designing and improving machinery. This phase of the work is recognized as an important activity. The securing of properly designed milk plants equipped with properly functioning machinery is the basis for the efficient handling and processing of milk and milk products, and facilitates the securing of improved supplies. This service is appreciated by the industry, and advice is frequently requested.

Consolidation of Dealers

In 1918 several conferences were held by the Association's Executive Officer with the smaller dealers bottling and dispensing raw milk. The result was the incorporation of the majority of these dealers into a milk company. A pasteurizing and bottling plant was established and the milk supply was obtained from a creamery operated by the company. The rest of the small distributors contracted for bottled supplies from this and other concerns. Through this arrangement small, inefficiently operated raw-milk bottling plants were eliminated, and sources of supply and processing of the milk were centralized, affording better control and supervision. The enforcement of the pasteurization ordinance was also facilitated.

Important Changes

The following figures are of interest in showing the changes and improvements during the existence of the Association:

POPULATION

1915	94,705
1928	154,418
Increase	63.05%

DAILY SALES OF MILK

1915	28,000 quarts
1928	54,446 "
Increase	87.30%

Daily per capita consumption equals about .359 quarts, which shows an increase of over 25 per cent since supervision has been maintained.

The illustration at the left shows a General Electric Novalux Suspension Unit equipped with Holophane B-SYM-ETRIC rippled bowl refractor. This refractor directs the light downward and spreads it up and down the street to provide approximately uniform illumination.

PLANNED LIGHTING

Haphazard street lighting —lights strung or set along streets or highways by guesswork or rule-of-thumb—is never efficient and seldom effective.

Such lighting often results in glare, in dark areas between lamps, in wasted current and in high costs of installation and maintenance.

Holophane street lighting is efficient. It is the application of Holophane Refractors in accordance with the fundamental principles of Scientific Street Lighting. Such cities as Cleveland, Detroit, Milwaukee, Minneapolis, San Francisco, Los Angeles, New Orleans and many others use Holophane Street Lighting.

For further particulars, for data on specific installations, for lighting recommendations for streets, parks, bridges, highways, etc., get in touch with the Street Lighting Engineers of the General Electric Company, the Westinghouse Co., the Line Material Co. or the Holophane Co., 342 Madison Ave., N. Y.

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DAILY MILK SALES ACCORDING TO GRADES

	1915	1928
Certified	2.09%	2.50%
A raw	42.50%	*1.44%
B raw	20.16%	Abolished in 1917
A pasteurized	8.33%	70.38%
B pasteurized	26.92%	25.68%

*Raw milk is permitted in Orange and South Orange only.

DAILY MILK SALES ACCORDING TO ANNUAL BACTERIAL AVERAGES
(Official Plate Count)

	1915	1928
10,000 and under	1.5%	55.83%
10,000 to 50,000	17.0%	44.17%
Over 50,000	81.5%	....

Cattle producing milk to be sold raw are tuberculin-tested annually. At present approximately 30 per cent of the cattle producing milk for pasteurization are tuberculin-tested under the Federal State Accredited System, although the testing is not required by the milk ordinances. The availability of milk for pasteurization from tuberculin-tested cows depends on the expansion of the work of the Bureaus of Animal Industry.

Ice Cream Supervision

In 1927 the Association undertook the supervision of ice cream supplies. The plants in the Oranges are small establishments operated in connection with confectionery stores, and the large manufacturing plants supplying retailers are located in New Jersey, New York and Pennsylvania and are controlled by "holding companies." Local plants secure milk and cream supplies from licensed and approved sources, but the large out-of-town manufacturers obtain their supplies from numerous sources located in fifteen or more states, and many of these are not supervised.

Official control of ice cream manufacturing has not been exercised. Education of the manufacturers is necessary for the proper conduct of their businesses and to bring them to a realization of their responsibility to the public health. Sufficient labor under the direction of sanitarians specialized in milk and milk products supervision should be employed by the manufacturers to assure the maintenance of proper methods and conditions and the dispensing of wholesome products.

Correction of defective and improperly installed equipment and the abatement of insanitary conditions and practices in ice cream plants is an important problem, requiring constant attention. The milk, cream, flavors and other materials used in these plants also require supervision.

A series of bacterial counts did not indicate the true conditions under which the ice cream was manufactured. Until such time as disinfection is discontinued as a substitute for cleanliness, bacterial counts will not be of real value. In the majority of instances, the supplies have been found to be within the legal butterfat standards.

Considerable progress has been made in securing improvements since the work was undertaken. It is apparent that, with few exceptions, the manufacturers are endeavoring to cooperate. Failure of plants to meet legal requirements and proper standards will warrant exclusion from the market.

Considerable time and effort will have to be given to the official supervision of the producing and dispensing of ice cream before the supplies will, to an appreciable degree, approximate the quality of the fluid milk supplies.

The advantages and economies of centralized control by this Association have been fully demonstrated. Its value to the industry, the health departments and the public is beyond question.

THE MONTH IN PUBLIC HEALTH

Conducted by JAMES A. TOBEY, Dr. P. H.

Public Health and the Law

ALTHOUGH modern health work depends as much upon education, instruction, and persuasion as it does upon force and police methods, the law is still a most potent and necessary element in public health administration. Every health official and every person in an administrative capacity in public health must therefore have a working knowledge of the law as it applies to his particular job. With such knowledge, he may often avoid personal embarrassment and even expense. Health officers have occasionally been sued for their actions, and some of them have been so unfortunate as to have had to pay judgments out of their meager salaries.

The scope and extent of the legal knowledge which is desirable for sanitarians has been set forth by the editor of this department in the January, 1929, issue of the *Public Health News* of New Jersey, where it is stated that "the legal knowledge possessed by the health official should be adequate to assist him in the reasonable and proper enforcement of the health laws and regulations and at the same time, by giving him a clear conception of the extent and limitations of his powers and responsibilities, enable him to be aware of the possible legal liability for his actions."

In the *American Journal of Public Health* for June, 1927, sanitarians were advised editorially to "familiarize themselves with some of the legal doctrines which are especially applicable to their chosen field of endeavor." Here it was stated that the health officer need not, of course, qualify as a member of the bar, but he should be sufficiently cognizant of his legal rights and responsibilities so that unnecessary litigation might be prevented or, if not avoided, at least successfully defended.

Most modern health officials are recruited from the medical or sanitary professions, which are the ones most closely allied to public health. Only rarely are such officials equipped with a knowledge of law when they take office. If a health officer has been trained in one of the reputable institutions offering degrees in public health, he will have had a short course in public health law. In any event, he will find that some acquaintance with the legal aspects of public health is an essential part of his technical equipment.

Cleanliness in Law and in Practice

A SURVEY of cleanliness legislation made by the writer and reported in the *Cleanliness Journal* for January, 1929, reveals the interesting fact that there were in 1928 a total of 233 state laws and regulations concerning some phase of cleanliness. The legislation studied does not, of course, cover the whole field of sanitation, but only those laws and regulations pertaining to the provisions for washing-facilities in barber shops, food establishments, hotels and restaurants, industries, jails, schools and swimming pools, and the requirements that individuals concerned shall wash their hands when the public health will be protected by that desirable action.

Of the 233 laws and regulations discovered in the 48 states, an average of less than 5 to a state, 96 were laws passed by the state legislatures and 137 were regulations promulgated by state departments, usually the state department of health. While most states have legislation applicable to cleanliness in food-handling, it was found that few provide by law or regulation for personal washing-conveniences in schools.

This fact is corroborated by a study of hand-washing facilities in schools, made under the direction of a committee of the School Health Bureau of the Metropolitan Life Insurance Co., of which C. E. Turner, Dr. P. H., of the Massachusetts Institute of Technology, was chairman. This committee collected data from 404 schools in the United States and Canada. They found that 53 per cent of the schools had available hot water, 80 per cent had

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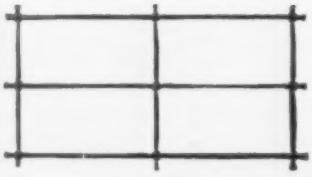

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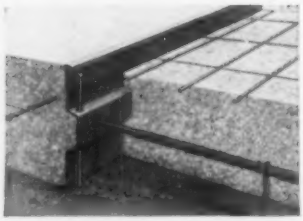

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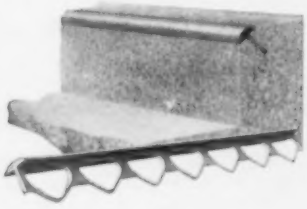

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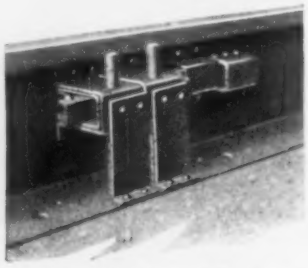

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Roads and streets must be strengthened to carry the heavier loads of constantly growing traffic. The modern concrete road, reinforced with Truscon Welded Fabric and protected with Truscon Contraction Joints, is the right answer to the problems. The reinforcement provides the added strength, the joints make a definite plane for expansion and contraction. Accurate and rapid construction of the road is promoted by Truscon Steel Road Forms.

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available soap, and 84 per cent had available towels.

When, however, the presence of all the requirements for adequate hand-washing facilities was considered, a much less favorable percentage was discovered. According to the standards of the School Health Appraisal Form devised by the Massachusetts Institute of Technology, which specifies hot water, soap and towels, conveniently located and at least one lavatory to every 40 pupils, only about 19 per cent of the schools were satisfactory. A somewhat larger number, or 32 per cent, complied with the standards of the American Child Health Association, which are the same except that one lavatory is allowed for every 80 pupils. Only about 6 per cent of the schools complied with a third and more stringent standard, the Wood-Rowell requirements for one lavatory for every 20 pupils, and most of these last were small rural or special open-air schools.

The Cleanliness Institute, of 45 East 17th Street, New York, has much valuable information on cleanliness, which is supplied to city officials and civic workers.

Drinking Fountains for All Cities

"WHY don't all cities have drinking fountains along the sidewalks?" is a pertinent editorial inquiry appearing in the *Medical Journal and Record* for January 2, 1929. The writer of this editorial states that in Portland, Ore., mountain springs seem to bubble at every street corner and that all the citizens apparently have the water-drinking habit and seem to flourish on it.

Pure water is necessary to good health, and physicians recommend at least six glasses a day of it for all normal persons. When water is convenient, it will be consumed, and there is consequently much merit in the suggestion that municipalities make this fluid more generally available. If they do, care should be taken to install bubblers which are really sanitary. Those in which the jet flows at an angle and where the outlet is protected so that the mouth cannot be applied directly to it are, in general, the best from the standpoint of public health.

Slaking the thirst should not be a problem, as it is so often at present. "While physicians are urging their patients to drink water freely and often," says the *Medical Journal and Record*, "they might exert some of their persuasive powers urging the city authorities to make water-drinking a simpler and more attractive process."

The Cheerful Health Department

THE bulletins of health departments should be messengers of good cheer and not carriers of lugubrious tidings. In at least one instance a somewhat morbid communication emanated from a health department, according to an item in the January, 1929, issue of the *Bulletin* of the Committee on Publicity Methods in Social Work. It seems that a student who had come down with measles was feeling the worst when he received this encouraging message from his local health department: "Measles now causes as many deaths as diphtheria, scarlet fever, and typhoid fever combined . . . ." The rest of the circular, we are told, described a procedure to be followed—to protect other people.

Modern sanitary science stresses positive health, and health department bulletins should do likewise. Doleful stories of deaths and mortality rates do not accomplish the education and instruction of the people in positive health as well as do more optimistic items about how to live salubriously and happily.

An Unusual Record

THE average tenure of office of health officers in this country is notoriously short. According to W. F. Walker, Dr. P. H., Field Director of the Committee on Administrative Practice of the American Public Health Association, data collected

DR. CHARLES V. CHAPIN
Superintendent of Health, Providence, R. I., for the last 45 years, and just re-elected. Dr. Chapin and his predecessor, Dr. Edwin M. Snow, appointed in 1856, have been the only occupants of the position since its establishment

in 1928 showed that the average tenure of office for the health officers of 138 American cities was only seven and a half years.

In January, 1929, Dr. Charles V. Chapin completed his 45th year as Superintendent of Health of Providence, R. I., and was re-elected for another term of three years. Dr. Chapin, now in his 73rd year, has probably held office as a city health officer longer that any one else in the United States. His nearest competitor for this distinction is, perhaps, Dr. George W. Goler, who was appointed Health Officer of Rochester, N. Y., in 1896, a dozen years after Dr. Chapin took office in Providence.

Dr. Chapin deserves fame not only because of his unusually long tenure of office, but as one of the foremost sanitarians of the modern era. In 1927 he was President of the American Public Health Association, and he is the only national honorary member of Delta Omega, the honorary public health society.

The information on the tenure of office of health officials assembled by Dr. Walker brings out the significant fact that the median length of service is longest, some eight years, when the health officer is appointed by a board of health, and shortest, only about four years, when he is appointed by the mayor or city manager.

New Methods for Using Human Milk

BREAST milk in bottles is a reality in a number of American cities, and its availabality in this way has saved the life of many a future citizen. For nearly eight years the Children's Welfare Federation of New York has been collecting and dispensing mother's milk. In 1922 this organization collected 973 quarts at a cost of slightly over $1,000, while in 1927 there were collected 2,533 quarts.

The system for gathering and using mother's milk has been described in a number of technical articles, the latest of which at the time of writing was a paper by Edith M. Philbin, R. N., in *Hospital Social Service* for January, 1929 (page 50). A review of the subject by Dr. B. R. Hoobler appeared in the *Journal* of the American Medical Association for June 4, 1927. In 1927 breast milk was collected by the Children's Welfare Federation from 116 mothers and after pasteurization was given to 400 different babies. Of these, nearly 72 per cent showed improvement in physical condition and only 2.6 displayed no improvement. A number, some 12 per cent, died, though in many instances the milk was called for one day only and may not even have been employed.

In Boston a scheme for drying human milk was devised some years ago, so that the surplus could be stored until needed. A small drying machine was constructed by two students in the mechanical engineering department of the Massachusetts Institute of Technology, who used this work for their thesis and not only won their degrees, but made a real contribution to human welfare. Detroit and Buffalo are other cities where human milk is distributed in fluid form, and there are undoubtedly others.

National Safety Council Sermonettes for Drivers

Highway orations never settled the right-of-way question.

* * *

Better to ride slow in an auto than fast in an ambulance.

* * *

You can't get by a grade crossing on your looks.

* * *

The one-armed driver may be courting his gal, but he is also courting disaster.

The most dangerous part of a car is often the nut that holds the steering wheel.

* * *

The Golden Rule is the best traffic law ever written.

* * *

A short wait at the corner may save a long one in the cemetery.

* * *

The skidding auto pilot cannot pick his landing field.

7 Days — from fresh concrete to truck traffic —

On heavy travelled California State Highway.

Use of the "Hunt Process" and a slight increase of cement content made this new section of State Highway ready for heavy traffic one week after the last batch was poured! This on the Conejo, an important section of the Coast Highway, where a steep grade and limited water supply presented unusual curing difficulties. Think of the delay—the labor costs, which the "Hunt Process" eliminates on a job like this!

Widespread Usage

From all parts of the country are coming favorable reports on the success of this improved method of concrete cure. Some of the biggest contractors in important cities are using it almost exclusively. Reduces traffic delay to a minimum! Speeds up construction—cuts corners on costs!

The "Hunt Process" has been tested and approved by the Engineering Department, City of Los Angeles and 67 other cities in the United States including Hawaii. Used on more than 325 jobs throughout the country and not a single instance of failure.

Concrete 8½% Stronger

By actual test it has been determined that this improved cure makes concrete 8½% stronger than that cured by the "dirt and water" method. This was the figure arrived at by making comparative tests of 296 cores from completed jobs.

Let us show you how the Hunt Process will reduce operating expenses—give a cleaner job and stronger cure, on any type of concrete construction. Ask for our illustrated booklet "Curing Concrete without Dirt and Water" by the "Hunt Process." Gives important data on tests, and other valuable information.

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THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, *Attorney at Law*

Territory Not Benefited by City Government May Be Properly Detached from City.—Fifty-one years ago, the Missouri River suddenly cut a new channel in such way as to eliminate a loop which indented the Nebraska border at Omaha. This operated to move 1,200 acres of Council Bluffs' territory to the Nebraska side of the river, and yet leave it Iowa soil and still under the government of Council Bluffs.

After fifty years of submission to the inconvenience of having to travel through Omaha in order to get to the main part of Council Bluffs, the dwellers in this small area sued to have it detached from Council Bluffs.

In the case of McKeon vs. City of Council Bluffs, 221 N. W., 351, the Iowa Supreme Court decreed a detachment of the territory, holding that plaintiffs had not lost their rights through delay, and saying, in part:

The purpose of municipal incorporation is to furnish local self-government and cooperative service. The needs of the municipality and the benefits to the property and residents thereon are the sole justification for inclusion of land within municipal limits. A municipality in this state may not, against the will of the owner, retain within its limits land merely for the purpose of deriving revenue from it. . . . It is the settled law of this jurisdiction that property may not be taxed for a purpose in which the owners or occupants have no interest, from which they can derive no benefit, and which is solely for the benefit of others, and that taxation for municipal purposes of agricultural land, which derives no benefit from the municipal government, cannot be sustained."

A Legislature May Authorize Liens Against Premises to Secure Payment of Water Furnished Tenants.—An owner of property in Boston unsuccessfully sought to compel discharge of a statutory lien filed by the city water-works department against the premises on account of water that had been supplied to a lessee of the property. In disposing of the controversy, the Massachusetts Supreme Judicial Court said in the case of Loring vs. Commissioner of Public Works of City of Boston, 163 N. E. 82:

"A lien for water-rates is neither a tax nor a special assessment for particular benefits. It is a method of securing the collection of a charge arising from the use on the real estate of a public utility essential to the health and safety of the community. It is supported on the general principles which justify the imposition of liens of numerous kinds. It must be regarded as settled that in general the Legislature may provide for the establishment and enforcement of liens upon the real estate to which water is furnished, even on the order of tenants and in the absence of express direction by the owner. This is on the broad ground that such liens aid in providing an adequate supply of water at reasonable rates and hence may be an appropriate element in a scheme of legislation for a public water-supply."

City Council Held Entitled to Award Legal Publications to a Newspaper of Large Circulation as Against Lower Bid of Another Paper.—The Duluth charter requires award of contracts to lowest responsible bidders, but permits rejection of any and all bids. Under this clause the Minnesota Supreme Court, in an opinion handed down in the case of State vs. Snively, 221 N. W., 535, refused to disturb the action of the City Council in awarding the publication of legal proceedings, etc., to a daily newspaper of a circulation of more than 30,000 throughout the city, as against a lower bidder of a weekly newspaper having a circulation not in excess of 3,100, in limited sections of the city. The Court said:

"In this case the Council, upon the advice of the City Attorney, may have been of the view that other provisions of the charter, which it is not necessary for us to consider, required the printing in question, or at least a portion of it, to appear in a daily rather than a weekly paper. It appears also that the Council thought, and with good reason, that, because publicity was the object in view, the daily paper with a large and general circulation would much better attain that end than a weekly with a circulation both small in number and restricted as to area."

Town Empowered to Regulate But Not Prohibit Importation of Garbage.—In the case of Donovan vs. Town of New Windsor, 231 N. Y. Supp., 82, the Supreme Court for Orange County, New York, granted a temporary injunction against enforcement of an ordinance of defendant town providing "that the bringing into the town of New Windsor, Orange County, New York, of decayed and spoiled fruit and refuse from households, restaurants and other eating-houses, be, and the same is, hereby prohibited, and that a violation of this resolution shall constitute a misdemeanor." The Court said:

"The ordinance in question is unreasonable and oppressive, because it prohibits rather than regulates the carrying of refuse into the town of New Windsor. It is a well-known fact that household refuse, decayed fruit, and garbage may be carried in sealed vehicles or containers without being in any wise offensive or a nuisance. The Town Board has power, by ordinance, to reasonably regulate the transportation of such materials in or through the town; but this ordinance is prohibitive rather than regulatory, and it is for that reason, in my opinion, invalid and unenforceable."

City Liable for Overflow of a Sewer Caused by Including in System Insufficient Private Sewer.—An owner of property damaged by overflow of a sewer maintained by a city has a valid claim for damages against the city if the injury be caused by including in its sewer system a private sewer of inadequate capacity, holds the Indiana Appellate Court in the case of City of New Castle vs. Smith-Jackson Co., 161 N. E. 692.

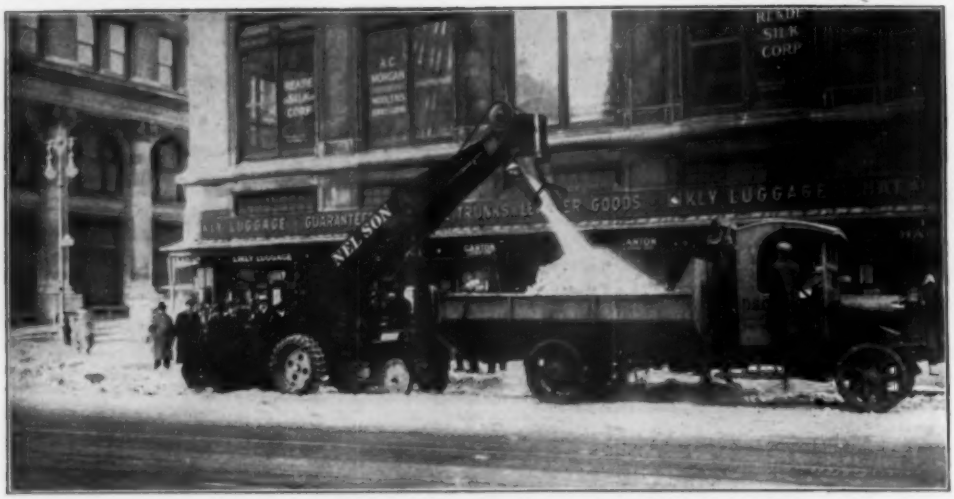
Counties Appropriately May Operate Parks.—Said the Florida Supreme Court in the case of Duval County vs. Bancroft, 117 So. 799:

"Counties have functions relative to the health, convenience, and welfare of the public in the county, particularly outside of municipalities; and such county functions may be performed by the county commissioners under their express and implied statutory powers and duties, in the absence of contrary provisions of law. Parks may be appropriate to county government as well as to municipalities. Functions incident to accepting and utilizing dedications of parks for local public purposes may be exercised by the county commissioners under their general express and implied statutory powers and authority as the chief administrative and fiscal officers for the county."

Negligent Maintenance of Sewer a Continuing Nuisance to Which Statute of Limitations Does Not Apply—Elements of Damage in Such Cases.—Where an action is brought against a municipal corporation for damages suffered by reason of offensive odors and disease caused by the negligent maintenance of a sewer system, and such negligent acts are alleged to have occurred within two years next preceding the filing of the action, a plea of the statute of limitations will not bar a recovery, though it appears from the petition that the sewer system was constructed more than two years prior to the commencement of the action. Discomfort, annoyance, and personal inconvenience caused by the offensive odors, and sickness caused by disease germs from the nuisance, are proper items of damage, for which recovery may be had. (Oklahoma Supreme Court, City of Sayre vs. Rice, 269 Pac. 361.)

City Held Liable for Private-Property Damage Caused by a Sewer—However uniform the rule may be as to the non-

Before Next Winter—Investigate



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Ask about the Nelson. Other cities and contractors have tried them, used them, liked them and bought more of them year after year until there are more Nelsons in successful use than all other snow loaders together.

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liability of a municipality for acts in the exercise of its governmental or legislative capacity, it does not apply when the municipality makes such a use of its land after the construction of the sewer as to constitute, as at bar, a private nuisance. Here the sewer was constructed upon the land of the city. In its use, sewage flowing through the sewer percolated the adjacent soil and contaminated the plaintiff's spring and lake, rendering the water of same unfit for domestic or other use, and ladening the air with foul odors.

This general rule, sanctioned by many courts of last resort, may, under the facts at issue, be held applicable in the determination of the instant case; if a sewer, whatever its plan, or the conditions under which it was installed, is so constructed as to cause a positive and direct invasion of the plaintiff's property by percolating the soil in such a manner as to contaminate the owner's water to such an extent as to render it unfit for use, then the city may be held liable in an action for damages arising from such injury. (Missouri Supreme Court, Witmer vs. Nichols, 8 S. W., 2d, 61.)

City May Be Empowered to Levy Special Assessments for Ornamental Street Lighting.—The right of defendant city to install an ornamental lighting system in its business district and to assess the cost against the adjoining property was upheld by the Oregon Supreme Court in the case of Fisher vs. City of Astoria, 269 Pac. 853. The Court considered two principal questions: (1) whether authority may be vested by legislative authority in a city to levy such assessments; (2) whether such authority was conferred by this city's charter. Both questions were answered in the affirmative. On the first point, the Court remarked:

"There is no allegation in the complaint that the ornamental feature of the posts has increased the cost of installing this system of illumination. Ordinarily, such details of the improvement rest largely in the discretion of the municipal officers. Nothing before us indicates that this discretion has been abused. . . .

"The city contends that placing a lighting system in a district of the municipality constitutes a local improvement, and that the property in the district may properly be assessed to pay for the benefit thus conferred; the plaintiffs take the opposite position. Based upon the information contained in the complaint, we assume that the proposed lighting system eliminates the cedar poles generally employed in Oregon cities for the purpose of holding in suspense arc lights, and in lieu of this method substitutes metal posts of an attractive appearance and lamps of great brilliance. Since the resolution specifies an up-to-date system, we assume that the wires which will convey the electric current to the lamps will be underground. It is common knowledge that many business men and property owners believe that such a lighting system renders the street more attractive to the retail trade and thus enhances values. Before the expense of installing an improvement can be assessed against the property in a district, it is essential that the improvement should confer a substantial benefit upon the property within the district. It may incidentally benefit the entire city; that wholesome effect will not destroy its use as the foundation for a local assessment, provided it brings to the proposed district a benefit substantially more intense than it yields to the rest of the municipality, or in the event its beneficial effect upon the local property is peculiar to that district. . . . .

"We understand that an ornamental lighting system is intended to add character to the particular locality, by eliminating the wooden posts and constituting for them permanent posts artistically designed. By eliminating overhead wires, it yields to the street a more spacious appearance, and, by employing a lamp of greater brilliancy, the street is better illuminated. Due to these circumstances, we believe that it confers a benefit upon the adjacent district which makes it the proper subject-matter of local assessment."

City Held Not Liable for Negligence Toward Prisoner Working on Street.—A city's immunity from liability for injury inflicted through wrongful or negligent exercise of governmental functions extends to injuries to city prisoners working on the streets, held the Mississippi Supreme Court in the case of Warren vs. Town of Booneville, 118 So. 290.

Plaintiff complained of disability resulting from his having been shackled in a wilfully negligent way while being so worked. But the Court remarked:

"We are of the opinion that the working of the streets is a mere incident to the carrying-out of the imposition of a sentence for crime on one who has violated the law or ordinance of the municipality, and that, if a prisoner is injured because of the manner of his being held, there would be no difference whether he were at work on the street, or at work in a municipal prison, making shoes or manufacturing cloth, or in the municipal blacksmith shop, engaged in hammering or welding, which latter are clearly and undeniably the exercise of governmental functions as to the prisoner so engaged."

Performance of Duties—Not Mere Holding of Office—Determines Right to Pay.—Title to office does not in itself entitle the incumbent to the pay belonging to the office; the right to pay depends upon rendition of the services constituting the duties of the office. In reaffirming this proposition of law in the case of Fitzpatrick vs. City of Passaic, 143 Atl. 728, the Supreme Court of New Jersey held that members of police and fire departments were not entitled to the pay of positions to which they were promoted where they never performed the duties of those positions.

Bonds Payable Out of Light-Plant Revenues Held Not to Be a Town "Debt" —Mere Equipment Is Not a "Public Utility."—A taxpayer of a Colorado town failed in an effort to enjoin the municipal authorities from issuing bonds to improve the local light plant operated by the town.

The Colorado Supreme Court ruled (Searle vs. Town of Haxtun, 271 Pac. 629) that the bonds did not constitute a debt of the town, within the meaning of a constitutional debt limit, since they were not payable out of general revenues of the city, but out of the revenues of the light plant.

The Court further decided that the issue did not come within the provisions of a Colorado statute, requiring assent of municipal electors to the acquisition of a "public utility." On that phase of the case, the opinion remarks:

"The bonds are to be issued for addition and improvements to a public utility, not to acquire one.

"Counsel says that the bonds are to buy a diesel engine, and that is a public utility. We think not. The term 'public utility' has come into use within the last 30 years in the sense, not of a chattel or other property used for the benefit of the public, but of a system of works operated for public use, examples of which are telephone, street railway, water, electric light and power, gas works, and other systems. A street-sprinkling truck is bought and held for public use, but the city need not take a vote of the taxpayers every time she buys one."

Mayor-Elect's Failure to Pay License Fee in Private Capacity Did Not Disqualify Him to Hold Office.—A Missouri statute, applying to cities of the third class, disqualifies for office any one who is "in arrears for any unpaid *city taxes*." Respondent was elected mayor of a city of that class, but was in arrears in the payment of a $10 annual *"license tax"* imposed upon painting and paperhanging contractors.

In the case of State vs. Broeker, 11 S. W. (2d) 81, the St. Louis Court of Appeals held that there was no delinquency in payment of "city taxes and that therefore the Mayor was not subject to ouster, In the opinion it is said, in part:

"The true distinction between a license fee and a tax proper seems to depend primarily upon the purpose of the enactment, and upon whether it is imposed pursuant to the police power, or under the taxing power vested in the municipality. In other words, if the fee is exacted for the prime purpose of enabling the municipal authorities to regulate or restrain an occupation or privilege dangerous to the public, or of a nature to be specifically in need of official supervision, and if compliance on the part of the licensee with certain prescribed conditions is required in addition to the payment of the designated sum, such fee is a license fee proper, imposed in the exercise of the city's police power, and is not, in strictness, an ordinary tax, as the term is commonly understood. On the other hand, where the fee is exacted primarily for revenue purposes, and payment of the fee confers the right upon the licensee to pursue his business or occupation without the performance of any additional conditions, it is not properly a license fee, even though so denominated, but is actually a tax, imposed under the general power of taxation."

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MUNICIPAL AND CIVIC PUBLICATIONS

Orders for books reviewed in this department will be filled promptly by THE AMERICAN CITY. Pamphlets, reports and all other publications should be ordered direct from addresses given. Prices do not include postage unless so stated.

Proceedings, Seventeenth Annual Meeting, Governmental Research Association.—Held at Cincinnati, Ohio, October 15-17, 1928. Published by the Governmental Research Association, 261 Broadway, New York. 151 pages, multigraphed, in stiff covers, $2.00.

On the first day of the Association's meeting, three sessions were held—a general session in the forenoon, a luncheon session with reports and papers, and afternoon round-table meetings. "A Fact Basis for Community Action," by John B. Blandford, Jr., and "Municipal Research and the City Manager," by Stephen B. Story, were important features of the general sessions, as were reports on the Association's affairs and special committee reports. Starke M. Grogan, of the Bureau of the Census, Washington, described at one of the round-table meetings the Government's methods of compiling the financial statistics of cities. All of these papers and reports and the discussions resulting therefrom are presented in condensed form by various members of the Association, as are the transactions of the two subsequent days' meetings, which were joint sessions with the National Municipal League. The Negro and Public Affairs, Measurement Standards of Government, Housing as a Municipal Responsibility, and Proportional Representation and Democracy were the topics of the more important sessions, prominent names represented on the program including those of Prof. Charles A. Beard, Arthur Collins and John Ihlder.

The Board of Estimate and Apportionment, New York City.—Joseph McGoldrick, Department of Government, Columbia University, is the author of this 152-page supplement to the *National Municipal Review*, February, 1929. No one is surprised, he says, that even the government of so unusual a city as New York is uncommon. But few realize how unique its Board of Estimate and Apportionment is. And later, "The really significant features regarding it are its unusual ex-officio composition, its development of an elaborate staff of advisers and investigators, and the process by which it has come to overshadow completely its companion, the Board of Aldermen." The history and the present scope and activities of the Board are given, and the need for reorganization discussed. 25c. (Apply to the *National Municipal Review*, 261 Broadway, New York.)

The Smoke Nuisance and Smoke Prevention and Abatement Activities.—A list of references on these subjects, including references to municipal ordinances and regulations, has been compiled by the Municipal Reference Library, Chicago, Ill., and issued in the form of a 9-page, typewritten release, copies of which will be sent for 10c. to cover postage. The main part of the list is arranged by cities. (Apply to Frederick Rex, Librarian, 1005 City Hall, Chicago, Ill.)

Library Service to Negroes, a Bibliography.—By Roland Mulhauser. "The purpose of this bibliography is to present the scattered material that has been written on library service to Negroes in a form that will allow it a maximum of usefulness." 13 pp., multigraphed. (Send 5c. for postage to Roland Mulhauser, Western Reserve University, Cleveland, Ohio.)

The Police Department of Houston, Texas, 1928.—According to its custom, the Department has issued a voluminous record of its year's activities in detail. This comprises 52 9 x 14 pp., multigraphed, completed indexed. Information under the large number of subheads is presented in concise form, and the report further recommends itself by the promptness of its appearance. (Apply to Tom C. Goodson, Superintendent of Police.)

Real Estate Practice, 1928.—Published by the National Association of Real Estate Boards, Chicago, Ill. 1,244 pp. To nonmembers, $10.00.

The National Association of Real Estate Boards has hitherto published its Annals of Real Estate Practice in separate volumes representing the separate divisions of the organization. Hereafter, the Annals will be issued in one volume, the 1928 edition being a substantial affair in legal buckram. It includes papers and addresses from the annual convention, and special reports on topics assigned by the executive committees of the various divisions.

The papers cover a wide range of subjects, taking in almost every department of the real estate business, from the first in the volume, "The Realtor as the New Pioneer," by Dr. Glenn Frank, President of the University of Wisconsin, in which a spirited challenge is given every practical realtor to be a bringer of beauty to his community, to highly technical matters of real estate law and finance. This wide scope of subject matter, the attractiveness and readability of the typography, and the adequacy of the indexing will make this a useful reference work.

In addition to general session papers from the 1928 annual convention, and other general material, the following have representation: Appraisal Division, Brokers' Division, Cooperative Apartment Division, Farm Lands Division, Home Builders and Subdividers Division, Industrial Property Division, Mortgage and Finance Division and Property Management Division.

Highway Map of Essex County, N. J.—A 22 x 22 folding map in colors showing state, county, and municipal roads, railroad stations, golf clubs, etc. Also, on its reverse side a smaller guide to the Metropolitan New Jersey motor roads, with certain traffic regulations, etc. Prepared by the Board of Chosen Freeholders. (Apply to the County Engineer, Hall of Records, Newark, N. J.)

Five Years of City Manager Government, Cleveland, Ohio.—The issue of *Greater Cleveland* for January 19, 1929, is devoted to "an impartial estimate" of this subject. Every phase of the administration is discussed, with the conclusion that "despite a weak and unrepresentative council, and many defects and errors on the administration side, Cleveland has had, under the city manager form of government, a more efficient administration and one which has taken a more comprehensive view of the city's problems than in any five years' period of the city's history." (Apply to The Citizens League of Cleveland, Swetland Bldg., Cleveland, Ohio.)

List of Inspected Fire Protection Appliances. List of Gas, Oil, and Miscellaneous Appliances.—Two supplements to lists dated July, 1928, as issued by the National Board of Fire Underwriters. 16 and 20 pp. Records of favorable reports issued after date of the present supplements, together with lists of withdrawals of material and devices, will be found in offices and agencies of Underwriters' Laboratories in principal cities of the United States and Canada. (Apply to National Board of Fire Underwriters, Testing Station, 207 E. Ohio St., Chicago, Ill.)

Five Minute Traffic Lessons.—Public Safety Series No. 19, is a 20-page booklet, 6 x 9, containing eight brief talks on traffic subjects, for presentation before clubs or other organizations or for expansion into lengthier form. This is a new edition of a very popular previous publication. Single copies, 25c.; 500 or more, 10c. (Apply to Public Safety Division, National Safety Council, 108 E. Ohio St., Chicago, Ill.)

American Standard Colors for Traffic Signals.—This Safety Code of Colors for Traffic Signals, published last month by the American Standards Association, represents the results of five years of study and research by members of a committee of 50 traffic, safety, railway and signal engineers working under the national standard procedure of the American Standards Association, with the American Association of State Highway Officials, the United States Bureau of Standards, and the National Safety Council, taking a leading part in the work. This code is not in conflict with the recently published report of the American Engineering Council's Committee on Street Traffic Signs, Signals and Markings, but goes into greater detail than the latter in establishing standards of colors for various traffic purposes. The two codes should, therefore, be considered together by engineers and officials having to do with street and highway regulation. The full text will be published in the 1929 Municipal Index. 10 pp. (Apply to the American Standards Association, 29 W. 39th St., New York.)

The Contract System of the City of Philadelphia.—The report of a City Contract Committee appointed by the Mayor (undated). 152 pp. It falls into two main divisions, dealing with the Department of Supplies, and with the General Contracting System. The Committee, composed of Philadelphia business men, called in experts in both phases of the study, and the detailed reports of these experts are appended, following a section of recommendations and conclusions. "The report comprises a comprehensive plan for reorganization of the Department of Supplies and the General Contracting System, and this plan is in general supplemented as to discussion and detail by the experts' reports." (Apply to W. James MacIntosh, Secretary of the Committee, Fidelity Trust Bldg., Philadelphia, Pa.)

The Taxpayer's Dollar, in Louisville, Ky.—Hon. W. B. Harrison, Mayor, and his administration want the public "to be fully advised as to the collection and distribution of all public moneys." Therefore, in a "full and frank exposition of the conduct of the city's business" they have issued a 16-page pamphlet showing how the taxpayer's dollar will be spent in 1929, with comparative tables showing the figures from other cities, also Louisville figures for former years. (Apply to Mayor's Office.)

A Suggestive Zoning Ordinance for New Jersey Municipalities.—Prepared by a special committee of the New Jersey State League of Municipalities, to provide "a precedent . . . capable of easy adaptation to the particular requirements of every municipality." "It has been the primary effort of the Committee to draft an ordinance sufficiently broad in its scope to meet, under proper definition by map or otherwise of the respective zones, the requirements of our largest cities, and the needs of our smallest townships," says the Committee's letter of transmittal. 10 multigraphed pp., 8½ x 15. (Apply to the League, 34 W. State St., Trenton.)

Clean-Up and Paint-Up Display Features.—Window cards, posters, streamers, banners, and all sorts of stereotypes and mats, are offered to local clean-up and paint-up committees at prices intended only to cover the cost of handling them. Official proclamation blanks, achievement report blanks, motion picture material, etc., may be ordered on the same basis. A new catalog is available and will be sent with any additional information requested, upon application to National Clean-Up and Paint-Up Campaign Bureau, 310 E. 45th St., New York.

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The Slum Problem.—By B. S. Townroe, M.A., Hon. A.R.I.B.A. With Introduction by Sir J. Walker Smith, M. Inst. C.E., F.S.I. (formerly Director of Housing at tht Ministry of Health). Longmans, Green and Co., London, Toronto, New York. 1928. 220 pp. $2.25.

This "strictly non-political survey" of the slum problem by one of the outstanding British authorities on the subject comes at a time to claim particular attention in this country in view of the recently aroused, widespread interest in more efficient housing for low-wage groups. It is a straightaway narrative of great clarity and simplicity, and one which covers a vast subject in small space.

Slums in general are discussed, and some exceptionally illuminating definitions fixed; and the principal economic and psychological factors entering into slum-making are shown, with their cumulative, unwholesome results and the great losses involved. A brief history of the slum conditions of Great Britain from 1842 to 1914 is followed by an account of progress made in slum clearance since 1919, by the Government and through government aid, and of achievements to date of voluntary associations and private landlords.

The lengthy section on "Remedies" will perhaps prove most profitable reading for American students of the slum problem. It contains chapters on "Reconditioning," "Town Planning," "Garden Cities," "High Tenements," "Industrial Enterprises," and "Women Management." These remedies are discussed with the British situation in mind, but frequent reference is made to American conditions. There is also a chapter on the American slums, in which the author tells us, on authority of Lawrence Veiller, of the National Housing Association, that the United States "has the worst slums in the world, and has done next to nothing in the direction of slum clearance." After reviewing our "sporadic attempts," including the New York City experiences under the State Housing Law of 1926, the author says: "We may hope that the Americans with their fresh minds and keen wits may devise new methods of meeting the slum problem, as they have done in the industrial world. At present, they seem to be walking on the same treacherous path of press stunts and subsidies that the British found some years ago led to increased costs of building and consequently intensified the magnitude of the problem."

In a brief, final glance futureward, Mr. Townroe expresses belief that scientific town planning will attack the slums at their most vital points, and regrets that the process is one so essentially slow. He closes on the hopeful note that both local authorities and voluntary associations of Great Britain are alive today to the immensity of slum evils; and that much more is being done towards their future correction then is generally realized. May it not be that in America, too, a similar note of optimism is now justified!

Catskill Water Supply—A General Description.—A 50-page booklet of the Board of Water Supply of the City of New York describing the development of the city's water-supply during the present century, with particular attention to the Esopus and Schoharie developments in the Catskill Mountains, and the aqueduct bringing the water to the city. Plans for additional water supply are briefly outlined. Illustrated. (Apply to the Board, Municipal Building, New York.)

Ground Water Supplies of the Atlantic City Region.—Bulletin 30 of the Department of Conservation and Development, of New Jersey. It is by David G. Thompson, geologist, United States Geological Survey, and is based upon field investigations made during a four-year period beginning July 1, 1924, by the author working in cooperation with the Department's Division of Waters. It is the first in a series on ground-water conditions in various parts of the state. 138 pp. (Apply to the Department, Trenton, N. J.)

Comparative Water Rates in 90 Illinois Cities and Villages.—Bulletin No. 35 of the Illinois Municipal League, dated December, 1928. It includes information on customers, meters, sources of supply, treatment, etc., in addition to rates, as obtained by a questionnaire 35 pp. (Apply to the League, Urbana, Ill.)

Public Poor Relief in North Carolina.—By Roy M. Brown, Research Associate in the Institute for Research in Social Science, University of North Carolina. University of North Carolina Press, Chapel Hill, N. C. 1928. 185 pp. $2.00.

Official welfare bodies and others in North Carolina have been studying the problem of more adequate methods for administration of poor relief. The present work has been produced to fulfill a need which arose in the process of the studies for a complete history of such work within the state. It traces official charity from the earliest Colonial days down to the present, with an introductory chapter on "The English Background" and a final chapter of "possible solutions." The county almshouse, the "poor farm," is obsolete It is ecomonically wasteful, and tends to create certain physical and moral conditions of unwholesomeness. Substitutes are discussed, the most promiseful of which is the county-unit hospital home, with which experiment is now being very successfully made in Vance County. Many of the more modern county homes of the state could be converted into such units, the author states, and by living up to hospital standards could have the aid of the Duke Foundation funds. Intelligent social planning would greatly reduce the already very small groups of well inmates.

Building Up a Municipal Personnel System: Detroit.—Six pages of *Public Personnel Studies*, issue of January, 1929, are devoted to the third of a series of articles outlining the manner in which a serious attempt is being made to strengthen and improve personnel administration as carried on through a central agency in a populous municipality of the United States. Organizations in Cincinnati and Cleveland have been dealt with in the two previous studies. Other cities will be represented in later issues. (Copies of the magazine containing the present study and its two predecessors may be ordered for 50c. each from Bureau of Public Personnel Administration, Mills Bldg., Washington, D. C.)

Recommended Minimum Requirements for Fire Resistance in Buildings.—A tentative report of the Building Code Committee, U. S. Department of Commerce, George N. Thompson, Secretary. This is the seventh of a series of reports looking to the completest possible ensurance of public safety and at the same time promoting economy in construction. The 95 multigraphed pages include sections on Recommended Code Requirements with classifications according to type of construction and of occupancy; General Building Restrictions and on Fire Protection in general. The appendix contains lengthy discussions and tables having to do with the protection of structural members—columns, walls, partitions, etc. (Apply to the Committee, Washington, D. C.)

Budgetary Codes of the City of Cincinnati.—A 53-page pamphlet prepared under the direction of Henry Urner, City Auditor of Cincinnati, and issued under date of January 1, 1929. It gives the organization and functional classification used by the city, the income classification, and the expenditure classification by object. The latter classification is shown both in its numerical sequence and as a 35-page alphabetical list of objects of expenditure, with the code number under which each belongs. (Apply to City Manager.)

The Regulation of Electrical Utilities in New York State.—A memorandum of the City Club of New York, with covering letter, addressed to Governor Franklin D. Roosevelt, under date of January 25. A carefully prepared and forceful argument for an investigation of public-utility regulation, pointing out how the latter has failed to meet its supposed purpose of protecting the public. 43 pp. (Apply to the Club, 55 West 44th St., New York.)

Motor Buses Now Regulated in 44 States.—A brief article with a table giving the name of the commission having general regulatory powers over busses, the extent of its jurisdiction, and the date when the corresponding law took effect, for each state. By Kenneth L. McKee, Assistant Statistician of the American Electric Association, in AERA for February. 3 pp. 35c. (Apply to the Association, 292 Madison Ave., New York.)

Proceedings, American Society for Testing Materials.—This is the report of the 31st annual meeting of the Society, held in June, 1928, and is issued in two parts, of 1,184 and 904 pp., respectively. Part I contains the annual reports of 42 standing and research committees and three joint committees of the Society, including those on ferrous metals, non-ferrous metals, cement, lime, gypsum and clay products, preservative coatings, petroleum products, road and paving materials, coal and coke, timber, etc.; 81 tentative standards that have either been revised or are published for the first time are also given. Part II contains 42 technical papers with discussions, covering various investigations by experts in the field of engineering materials, including several papers on cement, concrete, bituminous mixtures, sewer pipe, gasoline, motor oils, etc. Each part is $6.00 in paper, $6.50 in cloth, and $8.00 in half-leather. (Apply to the Society, 1315 Spruce St., Philadelphia, Pa.)

Report of the Committee of American Engineering Council on Street Traffic Signs, Signals and Markings.—This important report, most of which appeared preliminarily in THE AMERICAN CITY for November, December and January, with a further reference at page 21 of February, is published as a 58-page pamphlet, with illustrations of signs. 25c. (Apply to the Council, 26 Jackson Place, Washington, D. C.)

Public Improvements in Manhattan.—By Julius P. Miller, Borough President. 1928. The new county Court House, the creation of a new thoroughfare from the Battery through Central Park, the extension of Sixth Avenue to make it a main thoroughfare, and the extension of Riverside Drive are among major construction features in this well-illustrated report of many accomplished improvements. Account is given of the proposed elevated express highway along the Hudson River water front, and of other proposed improvements, including a 38th Street cross-town traffic tunnel. 40 pp. (Apply to Office of Borough President, Municipal Bldg., New York.)

Tournament of Roses, Pasadena, Calif.—The New Year, 1929, issue of the *Pasadena Evening Post* took as in past years the form of a profusely illustrated souvenir book of about 60 pages describing the most distinctive features of the city's annual celebration, which has become a matter of national interest. (Apply to Pasadena Chamber of Commerce.)

Safety Posters, 1929.—The preparation and distribution of 40 safety posters per month is one of the important services of the National Safety Council to its members. A total of 6,200 bulletin board posters has been issued on a wide range of safety subjects. This general catalog contains miniature reproductions of 360 of these, with complete information as to the availability of poster service on a membership basis, with a scale of rates. (Apply to the Council, 108 E. Ohio St., Chicago, Ill.

Opinion of Corporation Counsel and Assistants, Chicago, 1928.—Since 1897, opinions of the Chicago Corporate Counsel, of general or permanent interest to the City Council, have been published in permanent from. In Vol. XVI (April 16, 1927, to April 15, 1928) for the first time opinions included have been carefully analyzed and summarized. The complete index, by subjects, makes the opinions easily available for reference use. 585 pp., legal buckram. (Send 20c for postage to Municipal Reference Library, City Hall, Chicago, Ill.)

The Model Municipal Traffic Ordinance.—A 6-page article by C. W. Stark, Secretary, Committee on Municipal Traffic Ordinances and Regulations, National Conference on Street and Highway Safety, reprinted from the *National Municipal Review*,, November, 1928. Its intent is to show how, if the model ordinance were generally adopted, it would reduce traffic accidents. (Apply to the Conference, Dept. of Commerce, Washington, D. C.)

Westchester County Planning Federation, 1928.—This is the second annual report of the Conference, and is a record of substantial progress. It contains among other detailed information a comprehensive table showing the status of planning and zoning in the member municipalities of the Federation. 12 pp. (Apply to the Federation, 201 Main St., White Plains, N. Y.)

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Twenty-First National Conference on Weights and Measures, 1928.—A 168-page publication containing in addition to the presidential address of Dr. George K. Burgess and abstracts from state reports, important papers, committee reports and discussions. A 20-page paper by Ralph W. Smith discusses the Bureau of Standards investigation on the transmission drive for taximeters. One session was devoted to gasoline meters, and a number of papers were devoted to questions of weights and measures as they concern the business man. 35c. (Apply to Government Printing Office, Washington, D. C.)

Inequitable Assessments—The Causes and the Cure.—A 16-page pamphlet setting forth the advantages of scientific appraisal methods, with brief description thereof and suggestions as to how to put them into effect. (Apply to The Manufacturers' Appraisal Co., 4021 Walnut St., Philadelphia, Pa.)

Lighting St. Louis.—A 16-page history and description, in popular style, of the new street-lighting system in St. Louis, illustrated Special publication 1823, Westinghouse Elec. & Manufacturing Co. (Apply to the company, East Pittsburgh, Pa.)

Other Reports Received

Boston, Mass.—Annual Report, Assessing Department, 1927. 74 pp.

Hawaii.—Annual Report, Superintendent of Public Works of the Territory, to June 30, 1928. 62 pp.

Newton, Mass.—Annual Report, City Engineer, 1927. 52 pp.

Pasadena, Calif.—Annual Report, Water Department to June 30, 1928. 70 pp.

San Francisco, Calif.—Annual Report, Department of Public Works, Bureau of Engineering, City and County of San Francisco, to June 30, 1928. 122 pp.

CONVENTIONS—WHEN AND WHERE

March 6-8.—Saskatoon, Sask.
Saskatchewan Association of Rural Municipalities. Annual convention. Secretary-Treasurer, W. E. Hodge, 227 Main Street, Washington, D. C.

March 14-16.—Clearwater, Ga.
Florida Engineering Society. Annual meeting. Secretary, J. R. Benton, Gainesville, Fla.

March 19-23.—Seville, Spain. March 27.—Barcelona, Spain.
International Union of Local Authorities. Fourth International Congress. General Secretary, E. Vinck, Rue de la Regence, Brussels, Belgium.

March 20.—Baton Rouge, La.
Louisiana Chamber of Commerce. Annual meeting. General Manager, Herbert Bayliss, P. O. Box 486, Baton Rouge, La.

March 22-23.—Trenton, N. J.
New Jersey Sewage Works Association. Annual meeting. Secretary, John R. Downes, Bound Brook, N. J.

April 4-6.—Great Falls, Mont.
American Water Works Association, Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

April 9-12.—Louisville, Ky.
National Urban League. Annual meeting. Executive Secretary. Eugene Kinckle Jones, 17 Madison Avenue, New York.

April 10-11.—Jacksonville, Fla.
American Water Works Association, Florida Section. Annual meeting. Secretary, E. L. Filby, P. O. Box 135, Jacksonville, Fla.

April 11.—Farmville, N. C.
Eastern Carolina Chamber of Commerce. Annual meeting. Secretary, N. G. Bartlett, Kinston, N. C.

April 15.—Greensboro, N. C.
North Carolina Public Health Association. Annual meeting. Secretary, Dr. F. M. Register, Bureau of Vital Statistics, Raleigh, N. C.

April 15-17.—Birmingham, Ala.
Southeastern Water and Light Association. Annual convention. Secretary, W. F. Stieglitz, Columbia, S. C.

April 17-18.—South Bend, Ind.
Indiana Association of Chiefs of Police. Annual meeting. Secretary-Treasurer, A. G. Eversole, 1123 Main Street, Lafayette, Ind.

April 17-19.—Augusta, Ga.
County Commissioners of Georgia. Annual convention. Secretary, Fred Houser, 218 Wynne-Claughton Building, Atlanta, Ga.

April 22-25.—Washington, D. C.
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

April 23-25.—Washington, D. C.
American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

April 23-26.—Pittsburgh, Pa.
Building Officials' Conference. Annual meeting. Secretary-Treasurer, Col. John W. Oehmann, Inspector of Buildings, District Building, Washington, D. C.

April 26-27.—Philadelphia, Pa.
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, 3622-24 Locust Street, West Philadelphia, Pa.

April 29-May 3.—Washington, D. C.
Chamber of Commerce of the United States. Annual meeting. Secretary, D. A. Skinner, 1615 H Street, N. W., Washington, D. C.

May 5-11.—Washington, D. C.
National Congress of Parents and Teachers. Annual meeting. Executive Secretary, Mrs. A. C. Watkins, 1201 16th Street, N. W., Washington, D. C.

May 13-15.—Chicago, Ill.
National Highway Traffic Association. Annual convention. Secretary, Elmer Thompson, 12 East 53d Street, New York.

May 13-16.—Memphis, Tenn.
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

May 13-18.—Washington, D. C.
American Library Association. Annual convention. Secretary, Carl H. Milam, 86 East Randolph Street, Chicago, Ill.

May 16-17.—Houston, Texas.
League of Texas Municipalities. Annual convention. Executive Secretary, Harvey W. Draper, 319 Kress Building, Houston, Texas.

May 20-23.—Buffalo, N. Y.
National Conference on City Planning. Annual. Secretary, Flavel Shurtleff, 130 East 22nd Street, New York.

May 22-24.—Philadelphia, Pa.
American Association of Museums. Annual meeting. Director, Lawrence Vail Coleman, Smithsonian Institution, Washington, D. C.

May 22-24.—Philadelphia, Pa.
American Federation of Arts. Annual convention. Secretary, Miss Leila Mechlin, Barr Building, Farragut Square, Washington, D. C.

May 23.—New York.
National Board of Fire Underwriters. Annual meeting. General Manager, W. E. Mallalieu, 85 John Street, New York.

June 3-4.—Washington, D. C.
Conference of State and Territorial Health Officers with the United States Public Health Service. Annual. Address: Surgeon General, U. S. Public Health Service, Treasury Department, Washington, D. C.

June 3-6.—Atlanta, Ga.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

June 3-6.—Buffalo, N. Y.
National Association of Purchasing Agents. Annual convention. Secretary-Treasurer, G. A. Renard, 11 Park Place, New York.

June 4-7.—Washington, D. C.
National Conference on Weights and Measures. Annual. Secretary, F. S. Holbrook, Bureau of Standards, Washington, D. C.

June 19-22.—Chicago, Ill.
National Federation of Settlements. Annual convention. Secretary, Albert J. Kennedy, 184 Eldridge Street, New York.

June 24-28.—San Francisco, Calif.
National Probation Association. Annual convention. General Secretary, Charles L. Chute, 370 Seventh Avenue, New York.

June 24, Week beginning.—Toronto, Ont.
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

June 24-29.—Toronto, Ont.
American Water Works Association, Canadian Section. Annual meeting with American Water Works Association. Secretary, A. U. Sanderson, Island Filtration Plant, Toronto, Ont.

June 24-29.—Boston, Mass.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, Straus Building, Chicago, Ill.

June 26-July 3.—San Francisco, Calif.
Association of Community Chests and Councils. Annual meeting. Executive Director, Allen T. Burns, Graybar Building, 43d Street and Lexington Avenue, New York.

June 26-July 3.—San Francisco, Calif.
National Association of Travelers Aid Societies. Annual convention. General Director, Sherrard Ewing, 25 West 43d Street, New York.

June 26-July 3.—San Francisco, Calif.
National Conference of Social Work. Annual. General Secretary, Howard R. Knight, 277 East Long Street, Columbus, Ohio.

September 12-19.—Rome, Italy.
International Federation for Housing and Town Planning. International Housing and Town Planning Congress. Address: Lawrence Veiller, Secretary, National Housing Association, 105 East 22nd Street, New York.

September 17-20.—Portland, Me.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

September 30, Week of.—Minneapolis, Minn.
American Public Health Association. Annual meeting. Executive Secretary, Homer N. Calver, 370 Seventh Avenue, New York.

October 14-16.—Jacksonville, Florida.
International Association of Street Sanitation Officials. Annual convention. Secretary, A. M. Anderson, 100 North La Salle Street, Chicago, Ill.

October 14-19.—Louisville, Ky.
Playground and Recreation Association of America. Annual convention. Secretary, Howard S. Braucher, 315 Fourth Avenue, New York.

October 14-18.—Philadelphia, Pa.
American Society for Municipal Improvements. Annual convention. Secretary, C. W. S. Sammelman, 315 Commercial Building, St. Louis, Mo.

October 20-23.—Milwaukee, Wis.
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, S. V. Saxby, Chamber of Commerce, Duluth, Minn.

October 22-25.—Birmingham, Ala.
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Fire Chief, Yonkers, N. Y.

November 18-21.—Miami, Fla.
American Institute of Park Executives and American Park Society. Annual convention. Executive Secretary, Wm. H. Walker, South Bend, Ind.

November 20-23.—Ft. Worth, Texas.
International City Managers' Association. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kansas.

for Economical Transportation

CHEVROLET

This Great New Six-Cylinder 1½ Ton Truck—$545

(Chassis only) f.o.b. factory Flint, Michigan

Illustration shows dump body mounted on Chevrolet 1½ ton chassis with cab.

32% more Power

7 inches more Wheelbase

Economy equal to its 4-Cylinder Predecessor

Greater Speed

50% more Capacity

4 Speeds Forward

4-Wheel Brakes

AT a price of $545, the new six-cylinder 1½ Ton Chevrolet Truck makes available a dollar-for-dollar value that has never been duplicated in the commercial car industry!

Its new six-cylinder valve-in-head motor provides a power increase of 32%. It accelerates faster in every gear. It operates smoothly and quietly. And its fuel-economy and cost of maintenance are fully as low as those of its famous 4-cylinder predecessor!

Combined with this increased power and finer performance are a wheelbase of 131 inches and a rugged 189-inch frame—providing a carrying capacity of 1½ tons, with load space up to 9 feet. Throughout the entire chassis are found basic improvements that contribute to its outstanding performance, economy and safety: perfected four-speed transmission . . . ball bearing steering mechanism . . . powerful, quiet 4-wheel brakes, with independent emergency brake . . . and a completely equipped instrument panel!

Investigate this remarkable truck—extremely dependable and economical, it is ideally fitted for *your* business!

1½ Ton Chassis, $545 1½ Ton Chassis (with cab) $650 Light Delivery Chassis, $400 Sedan Delivery, $595. *All prices f. o. b. factory, Flint, Michigan*

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN
Division of General Motors Corporation

Q U A L I T Y A T L O W C O S T

NEWS AND ILLUSTRATIONS

Items *of* Interest *to* City, Town *and* County Officials, *and* Others Concerned *with the* Economical Construction *and* Efficient Operation *of* Public Improvement Undertakings

The Fairbanks, Morse Water Supply Co.

The development of a municipal water-supply involves serious responsibilities for city officials, since it is not always possible, even with the best engineering available, to definitely insure the success of a well-water supply undertaking. An important step has been taken in the elimination of uncertainties of water-supply developments in the announcement of the organization of the Fairbanks, Morse Water Supply Co. The parent organization, Fairbanks, Morse & Co., Chicago, Ill., has been a builder of pumps for many years and has during that time supplied pumps for many large municipal and industrial plants. The new subsidiary organization approaches the water-supply from an entirely different angle.

After a thorough geological survey and hydraulic investigation of a plant's water-supply has shown favorable possibilities, the Fairbanks, Morse Water Supply Co. will agree to deliver a definite quantity and quality of water at a definite price per 1,000 gallons. The plan is worked out so that the municipality is not required to invest any money in the pumping-plant. Water may be purchased at a fixed price for a period of years, at the end of which time complete title to the plant passes to the city. At any time during the period, the municipality has the option of taking over the plant.

The Fairbanks, Morse Water Supply Co. is headed by P. D. Bowler as Vice-President and General Manager. Mr. Bowler was one of the founders of the Layne & Bowler Corporation, and was President and General Manager of that organization for many years. Several installations of this character are now being developed, including one for the city of Havre, Mont., three plants for Brooklyn, N. Y., and one for Muskegon Heights, Mich.

Gorman Joins Wallace and Tiernan Staff

Arthur E. Gorman, formerly Chief Sanitary Engineer, Department of Public Works, Chicago, Ill., and more recently Public Health Engineer for the Sanitary District of Chicago, has joined the staff of Wallace & Tiernan Co. and will be located at the headquarters of the company in Newark, N. J., on sales promotion work.

Johns-Manville Corp. Acquires Celite Products Co.

The Johns-Manville Corporation, New York, has purchased the assets and entire line of products of the Celite Products Co., Los Angeles, Calif. In addition to insulating products, the Celite Products Co., has been a large producer of filtration materials, extensively used in sugar mills, oil refineries and sewage disposal plants. Celite for Concrete is another product of this concern, its primary function being that of increasing the workability of concrete.

Price Reductions on Tractors

The Caterpillar Tractor Co., San Leandro, Calif., on January 11 put into effect a new set of prices that marked both a reduction in prices of from $175 to $300 per unit, plus an adjustment between Pacific Coast and Midwest factories. This is the fourth major reduction and the sixth actual reduction in Caterpillar prices in the last four years as a result of increased production and improved manufacturing facilities.

The Use of Marble in Water Purification Plants

With the development of present water purification methods, it was natural that marble should be adopted for much of the apparatus in which it could be conveniently employed. The very purpose of a water treatment plant suggests the use of materials which exemplify sanitation and cleanliness. So it is that today marble is used to a great extent in modern filtration plants for control or operating tables, sample tables, gage stands and other kindred purposes.

Various other materials have been tried and have become obsolete as they proved more perishable than marble. At first, operating tables were constructed entirely of wood, but this proved unsatisfactory. The evident dampness of a water plant caused them to disintegrate and separate at the joints. The same dissatisfaction followed with wood tables with composition tops.

The modern water purification plant of today is a civic institution of beauty with carefully planned buildings, centralized usually in a well-maintained park. When a visitor walks through the main entrance to the filter building, his vision falls to the operating tables extending throughout the length of the operating gallery, and, to accord the interior of the building an appearance paralleling the natural beauty of the surrounding ground, these tables are constructed of marble.

The color of the marble makes little difference, provided there is harmony with the fixtures on the tables and elsewhere throughout the plant. Grey marble is probably the most popular, but white, pink and black marbles are frequently preferred. Fittings are finished in natural or statuary bronze, nickel, chromium or as desired, to harmonize with the marble that is selected. The purpose of the operating tables is to control the function of the filter, one table being provided for each fil-

MARBLE OPERATING TABLES IN THE FILTRATION PLANT AT PHOENIXVILLE, PA., INSTALLED BY THE ROBERTS MANUFACTURING CO.

WHY *an adequate* WORK-TEST *is offered on every* GENERAL MOTORS TRUCK

PLEDGED TO BETTER DELIVERY for 1 SAFER STREETS 2 LESS TRAFFIC CONGESTION 3 MORE ECONOMICAL DELIVERY

You make the test at our expense. We furnish the truck, gasoline and a man to accompany your driver

YOU keep the truck at your work long enough for a real, adequate tryout. Then, checking this truck's performance against *usual* performance, you'll know whether modern equipment *does* reduce time and distances. Whether modern trucks actually *increase* work capacity and work speed. Whether and how much operating costs can be lowered. How and why, modern equipment contributes greater safety in all traffic your trucks encounter.

You can use this practical information. That is why we offer this work test. A post card will bring you information as to the nearest representative through whom this test can be arranged for you. (Note: In states where such tests are unlawful, this offer does not of course apply.)

42 Basic
STRAIGHT RATING
Capacities

Choice of the *right* truck for the job is made easy by the 42 *different basic capacities* offered by General Motors Trucks. Includes 7 with the 1929 **PONTIAC** engine, STRAIGHT RATING capacities ranging from 3800 to 8000 pounds; 33 with the *New* **BUICK** engine, STRAIGHT RATING capacities from 800 to 18,000 pounds; **BIG BRUTE** powered, STRAIGHT RATING capacity of 28,000 pounds.

Every General Motors Truck is presented on the clear new basis of STRAIGHT RATING which clarifies investment and introduces new operating economies.

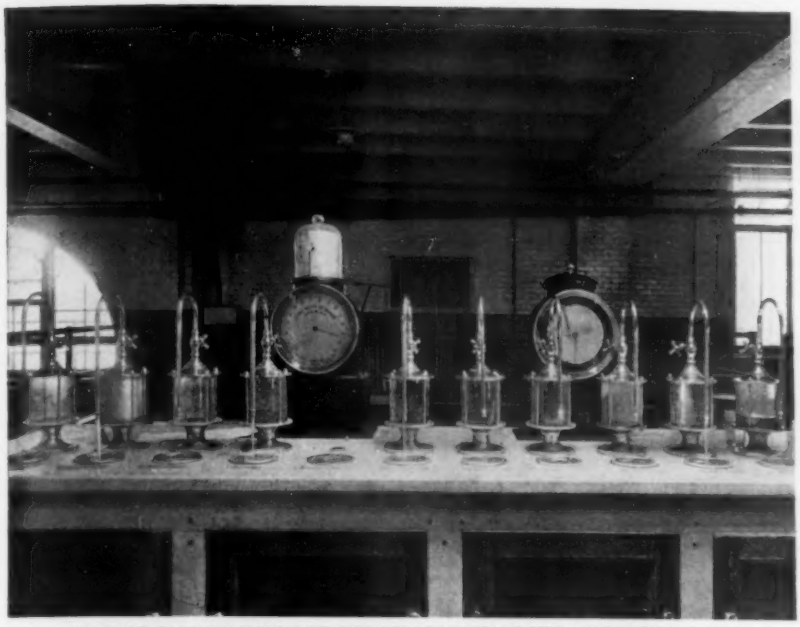
Prices contain no "water"—a man gets EXTRA VALUE instead of unsound "EXCESS ALLOWANCES."

Time payments through Y. M. A. C. plan, at lowest available rates

GENERAL MOTORS TRUCK COMPANY
PONTIAC, MICHIGAN

Factory branches, distributors, or dealers in 1500 principal cities and towns

ALWAYS INVESTIGATE WHAT GENERAL MOTORS HAS BEFORE YOU BUY



MARBLE SAMPLE TABLE IN THE FILTRATION PLANT AT TOPEKA, KANS.

ter. In some of the more recent plants two or more filters are controlled from a common table. Gate valves with hydraulic cylinders are installed on all connections, generally five or six in number to and from the filter. Four-way cocks are installed within the marble table and these cocks are connected through small piping to the respective hydraulic cylinders which they are employed to control. The four-way cocks are also connected to operating levers on top of the marble table, thus centralizing control of all valves at a single point, directly and conveniently in front of the filter.

The average operating table is 24 to 36 inches wide by 40 to 50 inches long. The usual height is 38 inches. Removable doors, generally of hard wood, are placed in the table to provide access to the interior equipment. The rear of the table is left open or provided with wood or metal grills for ventilation. The marble top slab should not be less than 1⅜ inches thick with rounded corners and beveled or rounded edges. The marble sides, front and rear of the table should be ⅞-inch thick with a 10½-inch thick surbase, 8 inches high. The marble should be rigidly assembled with steel or brass angles and straps and buttonhead throughbolts.

While operating tables present the greatest opportunity for marble in filtration plants, there are other features which merit its use. Sample tables, for instance, should always be of the same general appearance and construction as the operating tables. No modern filtration plant is complete without a conveniently located sample table with fixtures for drawing samples of the water from various points in process of treatment. In some plants, as for instance in the one now under construction for the city of Saginaw, Mich., marble is employed in lieu of hand railing in front of the filters. This lends a most attractive appearance and harmonizes with the operating tables and other features constructed of marble. In the filtration plant above mentioned the marble operating tables house the radiators, thus obscuring them from view. Metal grills are provided in the tables directly in front and rear of the radiators for heat circulation. This is a rather novel arrangement and certainly tends to improve the general appearance of the operating gallery.

—This text and the illustrations are furnished through the courtesy of the National Association of Marble Dealers, Cleveland, Ohio.

A One-Man Automatic Road Maintainer

The one-man automatic road maintainer exhibited by The Baker Manufacturing Co., Springfield, Ill., at the 1929 Road Show for the first time, is a multiple-blade machine with rope control from the tractor driver's seat. The blade sections are so arranged that the dirt is carried across the road four times in one trip, filling up all ruts and low places.

By pulling one rope the tractor driver can cause the blade to rise slightly, or to full height, for controlling the depth of the cut, or for raising the blades in crossing bridges, or when turning around. By pulling the other rope, the blade section can be instantly lowered. The rope control is operated through clutches on the rear wheels and permits fine adjustment of the cut while the maintainer is in motion. Hand wheel control is provided for operating the blades when the maintainer is stationary. The four-wheeled construction permits turning the entire machine around in a 16-foot road without backing up.

The Baker maintainer is made in two widths, 9 and 12 feet. They come with either steel- or rubber-tired wheels, the latter being equipped with Hyatt roller bearings. A scarifier attachment with manganese steel teeth can be furnished with either model.

THE BAKER ONE-MAN AUTOMATIC ROAD MAINTAINER WITH SCARIFIER ATTACHMENT

Monarch Tractors Corporation Becomes a Division of Allis-Chalmers

The Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has announced that it has taken over and is now operating the Monarch Tractors Corporation, as the Monarch Tractors Division, Springfield Works, of the Allis-Chalmers Manufacturing Co. The manufacture and distribution of Monarch tractors will be continued at the Springfield, Ill., works.

Reeder Joins Cleveland as Principal Assistant Engineer

H. Burdett Cleveland, consulting sanitary engineer, 225 Broadway, New York, has announced that Arthur L. Reeder is now connected with his office as Principal Assistant Engineer. Mr. Reeder has had extensive experience in water purification and sewage disposal design and construction, having been connected with the Philadelphia Filtration Bureau for 7½ years, with the Baltimore City Water Department for 5½ years, and with the Pennsylvania State Department of Health for 2 years. Recently, as Assistant Engineer in Charge of Design and Construction, he has been engaged on major water-supply and filter-plant installations at Reading, Pa., and at Youngstown and Niles, Ohio, the latter project now being carried out by the Mahoning Valley Sanitary District Commission.

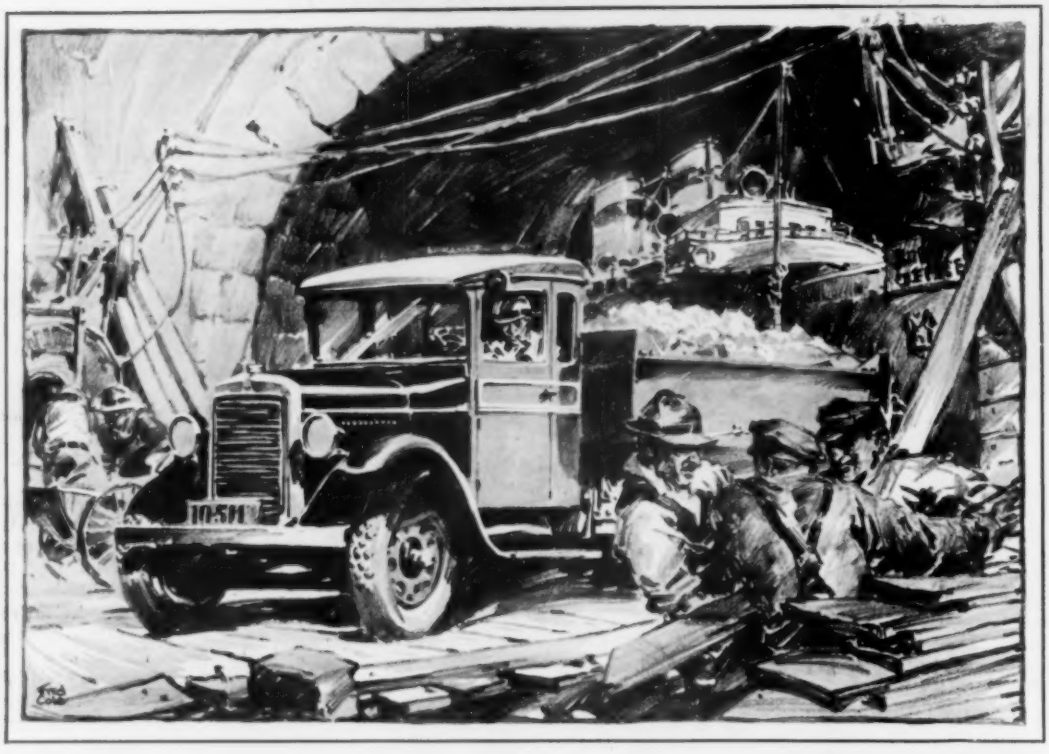
Union Metal Manufacturing Co. to Sell King Cast Iron Lighting Standards

An announcement has been made of the reorganization of the King Company, manufacturers of cast iron street-lighting products, with a manufacturing plant and general offices located at Sheffield, Ala., and sales offices in Chicago, Ill., whereby the general and sales offices will be located at Canton, Ohio, with the manufacturing plant remaining at Sheffield, Ala.

The Union Metal Manufacturing Co., Canton, Ohio, has entered into an agreement with the King Company to sell all of its products, and the General Electric Distributors Association and Graybar Electric Co., Inc., will act as agencies for the Union Metal Manufacturing Co., in selling both steel and iron lighting standards.

DODGE BROTHERS TRUCKS

CHRYSLER MOTORS PRODUCT



Set your own value standards ✓ ✓ then apply them to a Dodge Truck ✓ ✓ ✓

YOU know what you expect from a motor truck. You know the peculiarities of your business, of your loads, of the conditions under which you must operate—and you know them a little more intimately than any truck manufacturer can.

We know how to build good trucks . . . we build that kind—more than a million dollars' worth every week.

With sincere respect for your experience we ask your consideration of our truck . . . Set your own value standards . . . Fix on the speed you need, the power, the truck life . . . Set up your ideal for size, price, appearance, performance . . .

Then inspect the complete line at your Dodge Brothers dealer's . . . You'll find your ideal truck, if it's anything under a 4-Ton, whether you want to haul bricks or bouquets, laundry or lumber, petroleum or paving stones . . . Body and chassis complete . . . Let a painter grace it with your name, then put it to work.

Formerly Graham Brothers Trucks

The complete line of Trucks, Buses and Motor Coaches which Dodge Brothers have been manufacturing and selling under the name of Graham Brothers now take the name of their makers—Dodge Brothers.

These Trucks, Buses and Motor Coaches have always been powered by Dodge Brothers engines. For years they have been built of Dodge Brothers parts in Dodge Brothers plants according to Dodge Brothers standards.

These Trucks, Buses and Motor Coaches are sold, as they always have been sold, by Dodge Brothers Dealers everywhere.

PRICES

MERCHANTS' EXPRESS—110" w. b.	$ 665
COMMERCIAL TRUCK—120" w. b.	775
1-TON—130" wheelbase	995
1-TON—140" wheelbase	1065
1½-TON—150" wheelbase	1345
1½-TON—165" wheelbase	1415
2-TON—150" wheelbase	1515
2-TON—165" wheelbase	1585
3-TON—135" wheelbase	1745
3-TON—165" wheelbase	1775
3-TON—185" wheelbase	1845

Chassis f. o. b. Detroit

A DEMONSTRATION OF THE STRENGTH OF A SEWER PIPE JOINT MADE WITH RIC-WIL COMPOUND

A Strong, Watertight Sewer Pipe Joint Compound

The need for watertight sewers is obvious, for with an opportunity for sewage to flow out through joints, adjoining ground will be polluted. If, on the other hand, ground water is under pressure near the sewer, vast quantities of water will enter the sewer, greatly diluting the contents and increasing the bulk which must be treated at a sewage disposal plant.

Sewer pipe joints may be made permanent, waterproof and root-tight with Ric-wiL compound, which is made of selected, refined asphalt with an acid-resisting filler, by the Ric-wiL Co., Cleveland, Ohio. The joints are easy to pour, and harden immediately, so that backfilling can follow pouring at once. The manufacturers state that tree roots cannot enter joints made with this compound and yet Ric-wiL joints are flexible enough to absorb ordinary ground movement.

This joint compound is claimed to be impervious to acids and other chemicals in sewage or in the ground and is said to be virtually indestructible, lasting as long as the pipe itself. The accompanying illustration is proof that it makes a strong joint. Many tests have shown that the tile will often break before the joints are opened.

This compound is made with great care, of refined selected asphalt with acid-resisting filler and with no coal tar. It melts readily and pours best at from 285 to 325 degrees Fahrenheit, and does not precipitate or settle when reheated and, further, is not affected by summer temperatures.

Motor Truck Distributors for Tar and Asphalt Road Construction

A line of bituminous distributors for use in the application of tars and asphalts in highway construction and maintenance is manufactured by the Good Roads Machinery Co., Kennett Square, Pa. These Champion distributors are built in six models, divided into two types. Type PT obtains power for operating the distributing mechanism direct from a power take-off connected to the truck gears on which the distributor is mounted. In Type PU the power is developed by an independent power unit situated on the frame supporting the distributor, but at the front end, out of the operator's way and safely removed from any contact with the burners.

The construction of the Champion distributor is strong and sturdy throughout. The saddles which hold the tank are of forged steel, ⅝-inch thick with a 5-inch face, rolled to the proper radius to fit the tank. They also serve as the base to which the drive shaft bearings are attached. The tank, which on all models is built of locomotive fire-box steel in two complete sections or rings, and rivet-welded throughout, is rigidly bolted to the underframe at the rear end only, being firmly held down on the saddles at other points by anchor straps, thus allowing for the expansion and contraction of the tank in its saddles. A heavy vertical baffle plate of tank steel is built into the shell midway between the heads. This baffle is cut away at the top and bottom to allow the material to pass, but prevents the contents from surging from one end of the tank to the other when the truck is in motion.

The heating system is of the flue type, embodying the marine boiler principle of the internal fire-box, the large return flues at the bottom functioning in a similar way. The fuel oil tank holding 30 gallons has the capacity to keep both burners going constantly for ten hours. The oil is delivered to the burners under pressure generated in the feeding lines and pressure chamber after passing the fuel oil feed pump. The two burners are Aeroil, of the smokeless, non-carbonizing torch type, and are so arranged that they may be removed without disturbing the general piping system, a convenience appreciated by all operators.

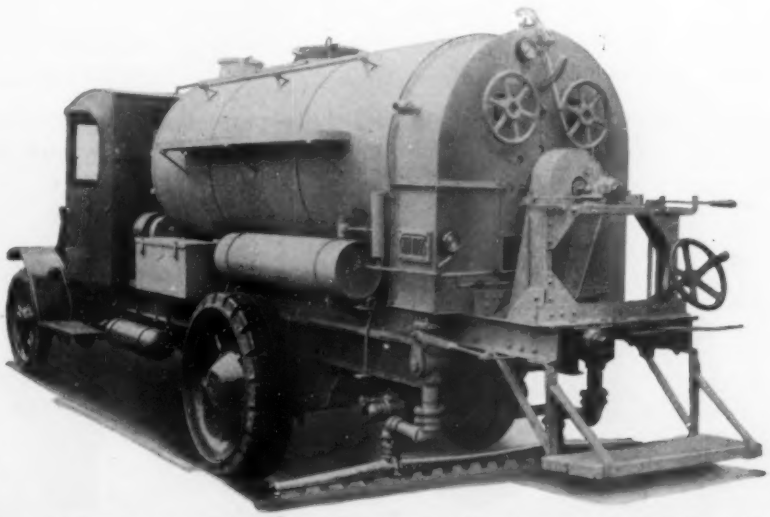
Two methods of loading the distributor are provided. Should the bottom level of the tank car or storage tank containing the material be slightly higher than the dome on the distributor tank, the loading may be accomplished by gravity through the manhole in the dome, which is provided with an interior strainer through which the material passes. Where the tank or other container is situated too low for gravity filling, the suction method must be used.

The distributing system is very simple, with fittings reduced to a minimum. Couplings are of the flange type, of forged steel and packed with asbestos, with all threaded joints electrically welded to the forged flanged couplings. All passage of materials throughout the system is on a vertical plane. Incorporated in the distributing piping is a relief and control valve which, keeps the pump and distributor lines free and clear. This valve acts as a by-pass whenever distribution is stopped at the manifolds, and for excess material returned to the tank when the patching hose is in use or one side only of the manifold lines is in operation.

For distribution of material on the road, the distributor has two 4-foot independent manifold bars or sections, each section being equipped with ten nozzles. These manifolds are of an alloy of aluminum, which is light in weight but strong and durable. They are so designed that the material feeds freely and equally to all nozzles.

The Type PT obtains the power necessary for operating the pump mechanism direct from the power take-off shaft of the truck chassis upon which the distributor is mounted, thus using the one engine for all services.

The Type PU has an independent power unit, consisting of a 4-cylinder, 20-horsepower LeRoi gasoline engine, complete with a right-angle drive, with gearing and clutch arrangement fully enclosed and running in an oil bath. This engine is of the light-weight, heavy-duty type, designed for dependable service in heavy construction equipment over a long period of time.



THE GOOD ROADS CHAMPION MOTOR TRUCK ASPHALT AND TAR DISTRIBUTOR

In St. Louis, the City street flushers make good use of Goodyear Heavy Duty Cushion Tires

TRACTION in water most of the time

It is always "rainy day driving" wherever this truck goes. Water flushes forth in a steady stream just ahead of the tires which pull the load. Wet asphalt, wet creosote block pavements call for exceptional traction almost at every turn of the wheels.

But the Goodyear All-Weather Tread bites through the sheet of water to firm footing beneath. The sharp-edged diamond blocks squeegee the road surface dry as they press down—without slippage, without waste of power, they roll their load along.

Even though the toughest of rubber must gradually wear down, the All-Weather Tread on these Cushion Tires can always have this powerful traction. The sides of these blocks are straight—the grooves are all straight lines. Thus, by a simple process of regrooving—which is a part of Goodyear service—the traction is restored, the cushion is maintained, with a certain gain in mileage.

Other Goodyear Tires just as accurately fit the needs of each municipal department using motor equipment.

Call on Goodyear for expert technical recommendations on the *right* truck tire for your hauling. Goodyear Truck Tire Service Stations everywhere give prompt, competent and helpful service.

More Tons Are Hauled on Goodyears Than on Any Other Tires

GOODYEAR

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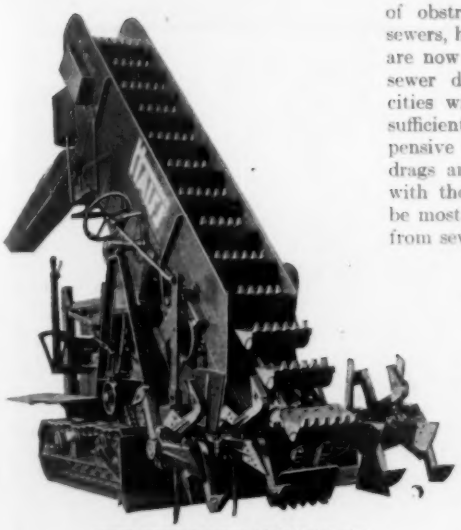


THE NEW HAISS EXCAVATOR

A New Continuous Digging Machine

A new machine for use in excavating, stripping, grading, and in sand and gravel pits is the Haiss excavator, made by the George Haiss Manufacturing Co., 142nd Street and Park Avenue, New York. This machine cuts a swath 8 feet wide, from 0 to 3 feet or more in depth, and as long as the job requires, and does the entire job in one continuous operation. No preliminary scarifying or plowing is necessary.

An 8-foot line of vertically revolving picks and propellers rips up the earth and feeds the buckets as the excavator crowds ahead. There is no interruption in the cycle of events. The picks break up the solid dirt, the propellers dig and feed, and the buckets discharge the spoil.

The buckets are equipped with heavy teeth that dig upward at the loading end. In tight places it is unnecessary to turn the machine around, as the spoil moves from the picks to the buckets, to the discharge chute, in a continuous straight-line path. At the point where the buckets discharge their load, is a swivel discharge chute, which discharges straight ahead or, at the will of the operator, to either side of the machine.

Constant feeding is accomplished by a crowding drive, a slow speed which continually advances the entire machine as the soil is dug away. A big 4-cylinder Waukesha engine, especially fitted for excavator service, supplies the power for the machine.

The excavator is mounted on long creepers with tread plates of the self-clearing type. In the construction of this new tool, high-quality manganese and alloy steels are used to produce a wear-resistant, shock-proof digging machine which under under favorable conditions will load 6 yards in 3 minutes.

A New Sewer Drag System

The Turbine Sewer Machine Co., 5210 State Street, Milwaukee, Wis., manufacturers of the well-known Turbine sewer cleaning machine, for removing all kinds of obstructions and obstacles from city sewers, have recently announced that they are now manufacturing and selling a new sewer drag system designed for use in cities without water pressure or without sufficient funds to purchase the more expensive water Turbine sewer cleaner. The drags are made in seven sizes, furnished with the equipment, which is claimed to be most effective in removing obstructions from sewers.

Engineers Establish Airport Division

Black & Bigelow, Inc., air transport engineers, 551 Fifth Avenue, New York, have added an Airport Division to their staff. This company was recently awarded the contract for all engineering and design work, including complete design of buildings and supervision of construction for the Central Airport, Camden, N. J., to serve the cities of Camden and Philadelphia.

A Grader with New Lifting Mechanism

The new Warco screw lift grader, which is manufactured by W. A. Riddell Co., Dept. F., Bucyrus, Ohio, utilizes a unique lifting mechanism. Two hand wheels, located at the rear of the grader, operate the screw through circle controls. The blade is thus easily raised and lowered. The Warco screw lift is built like a screw jack, a heavy, high-carbon screw being used. The mechanism is actuated by this large machine-cut steel screw turning in a machine-cut bronze nut and gear of one-piece construction, having a thread contact equal to 60 inches. The nut and gear are driven by a machine-cut high-carbon steel pinion and shaft, forged integral, which is connected by a shaft running to the cab. The gear and pinion are enclosed in a grease-tight housing.

Another feature of the new rear-control, one-man Warco grader is the newly designed cycle, having a large steel casting in the center with machined top and bottom, supported between guides at three points on the drawbar, with provisions for take-up in case of wear. Extra-heavy bars are hot-riveted to the circle and extend far out on either side to support the blade.

A. J. Sweet Joins Westinghouse

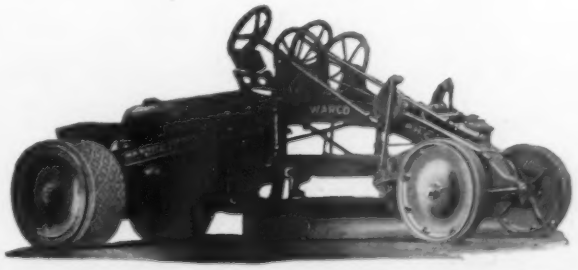
The Westinghouse Lamp Co., Bloomfield, N. J., has announced the association of Arthur J. Sweet, formerly in consulting practice in Milwaukee, Wis., with its commercial engineering department. Under Mr. Sweet's immediate direction, the company will initiate a broad program of service to the industry, in the development of street-lighting business and business-building possibilities. Mr. Sweet has long been well known in the street-lighting field, and believes that the social benefits to be derived from street lighting amply justify street-lighting expenditures at least double those of the present, and that the attainment of proper street-lighting service levels will have a profound influence in materially advancing service levels in stores, industrial, office and home lighting throughout the country.

Municipal Consultants in Appraisals and Construction

The firm of Craig, Skidmore and O'Brien, Inc., 308 West Washington Street, Chicago, Ill., has been formed to offer services in consultation, development and management, appraisals, investigations, design and construction. George W. Craig, President, was formerly City Engineer, Omaha, Nebr., a member of the firm of Rosewater and Craig, consulting engineers of Omaha, later City Engineer of Calgary, and engineering consultant, and recently engineer of the Asphalt Association. Morgan P. O'Brien is Vice-President of this new firm of consultants and is a consulting engineer in Decatur, Ill. He was formerly connected with the Engineering Department, Illinois Central Railroad; also Chief Engineer, Illinois Traction System, on construction, and Chief Engineer of Construction, A. E. Staley Manufacturing Co. Hugh W. Skidmore, Secretary-Treasurer, is a consulting engineer and President of the Chicago Paving Laboratory, Inc.

Airport Lighting Specialist Made General Sales Manager

The B. B. T. Corporation of America, Atlantic Building, Philadelphia, Pa., has announced that W. G. Treiber, Airport Lighting Specialist, who has been with the company for several years, has recently been promoted to General Sales Manager, in charge of all district representatives. Mr. Treiber has served as a direct contact man on all important B. B. T. installations throughout the country, and will continue to maintain this direct contact in special airport lighting problems in connection with his broader field as General Sales Manager.



THE NEW WARCO GRADER WITH SCREW-LIFT MECHANISM

Wide concrete pavement on Oak Street, Eugene, Oregon

Concrete Pavements Increase Property Values

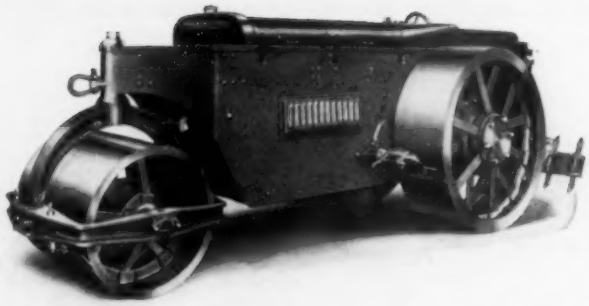
Every dollar spent in your community for portland cement concrete street pavements is an investment in permanent civic betterment—and in increased property values.

Wide, smooth, even-surfaced concrete pavements are the final solution to traffic problems. They relieve and prevent congestion, and add to the safety—as well as the enjoyment—of motoring.

Your streets should have the "dressed up" appearance which concrete pavements give. When a paving petition is presented to you, be sure that it calls for *concrete;* then sign it.

PORTLAND CEMENT *Association*

Concrete for Permanence CHICAGO



THE NEW AMES ROAD ROLLER

A Ten-Ton Road Roller with a Six-Cylinder Motor

A brand-new motor road roller containing many new features has been developed by the Ames Iron Works, Oswego, N. Y. The roller frame consists of reinforced steel plates ½-inch thick extending from the front roller yoke to the extreme rear. They are extended beyond the rear rolls to carry the scarifier attachment, and are cross-braced at several points for rigidity. The wheel-base is 120 inches and the overall width 78 inches. The length, including the scarifier, is 209 inches.

The Ames roller is powered by a 6-cylinder, 60-horsepower Hercules engine with positive pressure lubrication, a circulating water pump, and a Modine radiator, and connected to the transmission with a Twin Disc clutch.

The control for forward and reverse movement is a single lever with the position of the lever handle indicating the direction of motion.

The front roll is made in two sections 36 inches in diameter with a total width of 44 inches. It is constructed of a semi-steel casting with rolled wrought iron spikes cast into the hub and rim. The face of the roll is machined smooth. The rear rolls are constructed the same as the front rolls except that each is a single section 60 inches in diameter and 20 inches wide. Each rear roll is fitted with lugs to be used when scarifying and taper plugs for these holes when rolling. The rear roll overlaps the front roll 3 inches on each side.

The scarifier consists of a clutch-operated air compressor with an air tank. There are two air cylinders mounted vertically directly over the scarifier bar. The angle at which the teeth are set, together with the long drawbar employed, makes it possible to hold the scarifier down with very little power.

A New Asphalt Patching Plant

An asphalt street repair unit or patching plant known as Model H-1 and designed to meet the need for a patching plant with modern oil burners at a moderate price, has recently been announced by the Chausse Oil Burner Co., Elkhart, Ind. This new model has many of the features of the Chausse Model E-3 engine-equipped self-propelling outfit, but is built to be operated independent of any large stationary plants which cannot be operated economically on small yardage. It is a hand mixing plant designed for use directly on the street and contains many improvements.

As shown in the accompanying illustration, the plant is self-contained and is mounted on steel wheels, with roller bearings and 32-inch x 5-inch solid rubber tires. It has a towing tongue for ready attachment to a motor truck or tractor. At the front is a tool-heating compartment, lined with firebrick and asbestos, with a steel grizzly on which to place the tools, and equipped with a Chausse oil burner.

In the next section is located a tar kettle with a capacity of 150 gallons. This has an oil burner underneath which makes possible an initial pouring in from 15 to 20 minutes and will melt the entire capacity in about 45 minutes. The tar is conveyed through a 2-inch pipe to a measuring trough at the rear. Under the tar kettle is a large compartment for tools and accessories, including a machine type hand pressure pump for putting air pressure on the fuel tanks. In this space also can be kept the Chausse 3-gallon hand torch supplied for preheating the burners and for warming cold joints, drying patches and other uses.

At the rear of the body of the machine are three storage bins, one for stone and one for sand with capacities of 1 cubic yard each, and one for stone dust or chips with a capacity of 10 cubic feet. These bins discharge upon a large drying and mixing pan. Under this pan is a chamber into which point three Chausse burners with ample capacity for quickly drying normally damp aggregate. When the aggregate is dry and heated to the proper temperature, the asphalt is added from the measuring trough, stirred up by hand and dumped into a wheelbarrow.

Under the center of the machine are located two steel tanks for keresene with a capacity of about 60 gallons, sufficient for a day's run, with an air-pressure gage. The entire machine is built of steel, hot-riveted and welded throughout, with ample structural capacity for the service intended. The axles are of alloy steel.

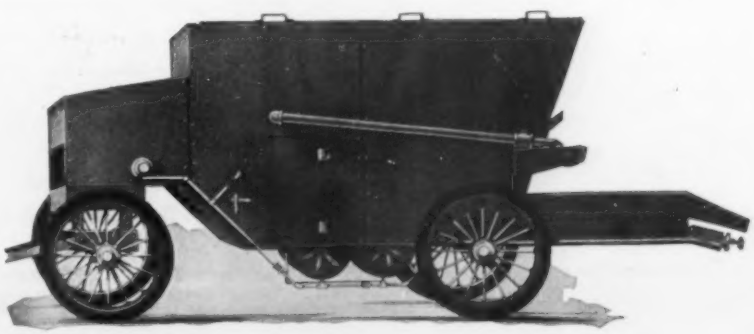
A large number of contractors and city officials have found a need for a complete but moderately priced patching plant with sufficient capacity for their lesser needs, and it was to meet this demand that this Model H-1 has been put on the market.

Glass Enclosures Increase Efficiency in Drying in Sludge Beds

Sewage disposal has become a question of paramount importance to all communities. Progressive municipalities are demanding special treatment plants to rid themselves of an obvious nuisance as well as a serious source of disease. In modern sewage treatment the sewage, taken from the mains in a raw state, is carried to an Imhoff tank, from which point the solids or sludge are pumped into drying beds. The glass sludge-bed enclosure made by the King Construction Co., North Tonawanda, N. Y., is an important part of the plant. These glass-enclosed structures are erected over the concrete drying beds, insuring rapid and constant drying of the sludge throughout the year. Besides protecting the sludge from rain and snow, the drying process is speeded by the transmission of the sun's heat through the glass to the sheltered interior. Thus, it is possible to remove sludge from the Imhoff tank at regular periods, materially increasing their efficiency. In addition to this improved method of drying, the glass enclosure also controls the offensive odors which are present when sludge is dried in open beds, and uses less space.

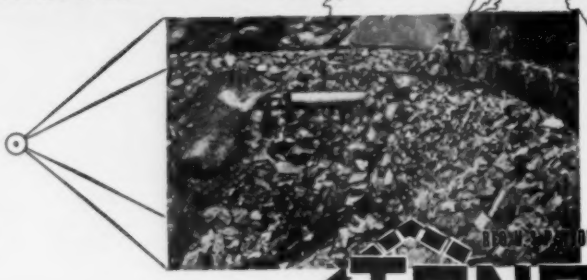
King sludge-bed enclosures consist of a strongly constructed, glass-and-steel structure of a design particularly adapted to work of this kind. The steel framework supports a wood-and-glass superstructure with provision made for necessary doors, ventilating sash, etc. The enclosures are furnished in many sizes, to accommodate a bed of required capacity. The steel frame is made up of copper-bearing steel side posts joined to cast iron sills placed on top of the concrete bed wall. These posts in turn support steel framing rafters spaced 8 feet 5 inches apart, which assures strength because of the short span between these members. The posts and rafters are united with steel angle eaves and purlins forming the frame which receives the wood-and-glass superstructure.

There are two types of King sludge-bed enclosures. One is built with a clear span truss steel frame, and the other with interior columns supporting the steel framing rafters. On account of the fact that sludge-bed enclosures are almost continu-



THE NEW CHAUSSE ASPHALT HEATING AND PATCHING PLANT

Culvert Conditions Vary But Toncan Iron Culverts Unvaryingly Resist Corrosion



TONCAN
COPPER
Mo-lyb-den-um
IRON

ATMOSPHERE, soils, temperature and drainage all vary. Culverts are called upon to withstand a wide variety of conditions.

The only unchanging, constant, dependable factor is the uniform quality of the Toncan Iron culvert and its unequalled resistance to corrosion under all the conditions a culvert encounters.

From southeast to northwest—all across the country—under thousands of highways, under railroads, in storm sewers, Toncan Iron culverts are combatting corrosion and keeping down maintenance.

Toncan Iron possesses unique properties of corrosion-resistance. Only Toncan Iron has the natural corrosion-resistance of refined iron fortified by the addition of Copper and Molybdenum.

Laboratory tests that compress many years of service into a few weeks prove conclusively the superior corrosion-resistance of Toncan Iron. It is the ideal culvert material.

TONCAN CULVERT MANUFACTURERS' ASSOCIATION, MASSILLON, OHIO

The Canton Culvert & Silo Co. Canton, Ohio
The Berger Mfg. Co., of Mass. Boston, Mass.
The Berger Manufacturing Co. Philadelphia, Pa.
The Berger Manufacturing Co. Roanoke, Virginia
The Berger Manufacturing Co. Jacksonville, Florida
The Berger Manufacturing Co. Dallas, Texas
The Berger Manufacturing Co Minneapolis, Minn.
The Berger Manufacturing Co. (Export), Canton, Ohio
Tri-State Culvert Mfg. Co Memphis, Tenn.
Tri-State Culvert Mfg. Co Atlanta, Ga.
The Firman L. Carswell Mfg. Co Kansas City Kan.
Wheat Culvert Co., Inc Newport, Ky.
Beall Pipe & Tank Corp. Portland, Ore.
Superior Culvert & Flume Mfg. Co Los Angeles, Calif
Superior Culvert & Flume Mfg. Co Oakland, Calif.
The Pedlar People Limited. Oshawa, Ontario, Canada

TONCAN COPPER MO-LYB-DEN-UM IRON

INTERIOR VIEW OF A KING SLUDGE BED ENCLOSURE WITH A 40-FOOT-WIDE STEEL TRUSS FRAME, AT CHEEKTOWAGA, N. Y.

ally subjected to dampness and moisture which would cause any ordinary wood to rot very quickly, the woodwork in these enclosures consists entirely of clear heart California redwood, selected because it is the most durable lumber that can now be procured commercially. The glass with which the sides, roof and gables are enclosed is Double B American, a high-grade window-glass of double thickness. It is furnished in 16 x 24-inch lights.

The entire structure is painted inside and out with three coats of weather-resisting paint, and correct ventilation is obtained by equipping the enclosure with roof ventilating sash on both sides of the ridge and at the sides. The sash are operated by specially designed machinery to enable quick opening and closing.

Recent King sludge-bed enclosure installations have been made at Alliance, Ohio, Cheektowaga, N. Y., Hornell, N. Y., Bergenfield and Dumont, N. J., Blacksburg, Va., Farmingdale, N. Y., New London, Conn., and Tonawanda, N. Y.

A Trailer Chip Spreader

A husky chip spreader of the trailer traction type is made by the Good Roads Machinery Co., Kennett Square, Pa. This spreader is designed with removable side wing pans in order to meet the needs of those having trucks with full width tail-gates. These side wing pans are adjustable to suit the various heights of truck bodies. Where the spreader is used with trucks having a small control gate inserted in the tail-gate, the use of the side wing pans is not necessary.

The main frame is a steel casting weighing over 200 pounds. All the bearings, as well as the sockets for the hopper legs, are cast integral. A steel housing is attached around the drive mechanism, and all alemite connections are brought to convenient locations. The wheels are cast steel, 12 inches in diameter and smooth tread. The hopper consists of a 4-inch channel frame with a heavy bottom plate. The opening in the plate is reinforced with a steel ring.

The flow of material to the spinner disc is controlled by a cast cone with a clamp washer, readily moved to suspend the cone in any desired position. The spinner disc is 28 inches in diameter, of 3/16-inch steel plate and is carried on a ball thrust bearing. A series of vanes to accelerate the travel of the chips are welded to the disc.

The height of the spreader, with wings, is 48 inches, the width 82 to 96 inches, and the width of the spread 12 feet at 2 miles per hour. For ready attaching to various trucks, the two steel tongues are adjustable and each carries a special coupling hook.

THE GOOD ROADS CHIP SPREADER, SHOWING METHOD OF ATTACHING TO A SMALL TRUCK, AND EQUIPPED

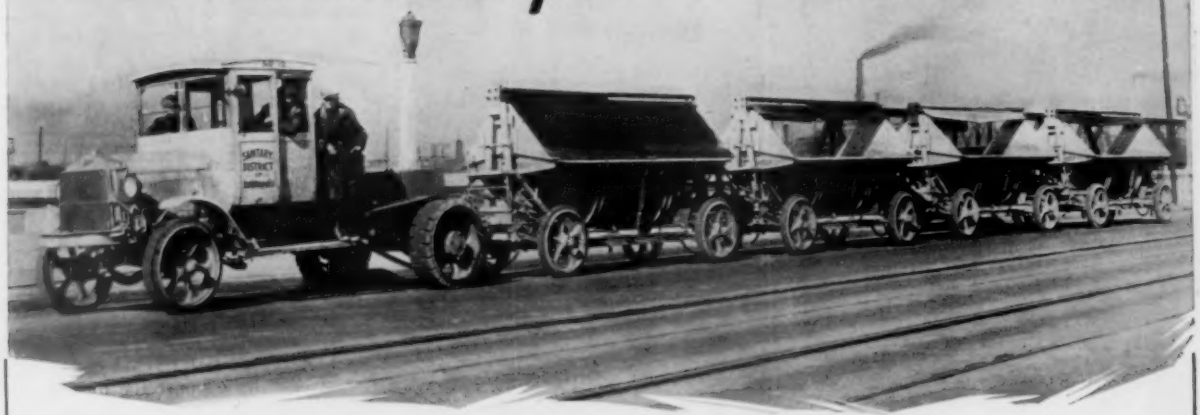
Pease Opens Los Angeles Sales Office

As a further step to meet its rapidly expanding distribution requirements, The C. F. Pease Co., 813-821 North Franklin Street, Chicago, Ill., manufacturers of blueprinting machinery, blueprint paper and drafting-room supplies, has established a new Pacific Coast sales office at 501 South Spring Street, Los Angeles, Calif. The office will be under the direction of Ralph S. Gibson, Western Sales Manager, who will devote his entire attention to the Western Coast states territory.

Barber-Greene Opens Office in Cedar Rapids, Iowa

The Barber-Greene Co., Aurora, Ill., manufacturers of ditchers, loaders, conveyors, etc., have recently opened a new office in Cedar Rapids,, Iowa, at 527-28 Merchants National Bank Building, under the supervision of Jack Marson. W. E. Toole at the same time opened a branch office under Mr. Marson at 106 Nicholas Street, Omaha, Nebr.

HIGHWAY TRAILERS
~Unanimously Chosen at Indianapolis



A splendid recommendation

Highway Trailers were unanimously chosen at Indianapolis. The Board of Sanitary Commissioners recently awarded the Highway Trailer Company it's fourth consecutive order for trailers. The Department "knew what they would do."

A question of quality

City Engineer A. H. Moore said, "It was a question of the quality of the product."

Literature of special interest on request

HIGHWAY TRAILER COMPANY *The World's Largest Trailer Plant* Edgerton, Wis.

"ACIPCO" Products Are All

Quality Q *Checked*

The "Q-check" symbol—recently adopted by the Cast Iron Pipe Research Association to denote cast iron pipe produced by modern methods, in accordance with established technical standard specifications—will hereafter appear on all pipe made by this company. Taxpayers, city officials and engineers can obtain full information on use of pipe for water, gas, sewers, road culverts and industrial needs by writing our home office at Birmingham.

The symbol shown above has been adopted as the trade mark of the Cast Iron Pipe Research Association. Insist on the "Q-check" mark when specifying cast iron pipe for gas, water, sewer or industrial service.

AMERICAN CAST IRON PIPE COMPANY

BIRMINGHAM, ALABAMA

DISTRICT OFFICES IN PRINCIPAL CITIES

DALLAS
CHICAGO
KANSAS CITY
LOS ANGELES
SAN FRANCISCO
SEATTLE
MINNEAPOLIS
NEW YORK CITY